

# INDEX OF SUBJECTS.

## ABSTRACTS. 1889.

And also to Transactions, 1889 (marked TRANS.); and to such papers as appeared in Abstract of Proceedings (Nos. 58—73, Dec., 1888—Nov., 1889, inclusive) but not in Transactions (marked PROC.).

### A.

- Abrus precatorius*, proteid poisons of, 1026.
- Absorption, evidence afforded by, of the decomposition of molecular groups in solutions, 554.
- Acenaphthene, action of chromium oxychloride on, TRANS., 582.
- intermediate products of oxidation of, TRANS., 578.
- ketone, TRANS., 580.
- perhydride, 720.
- tri- and tetra-bromo-, TRANS., 581.
- Acenaphthylene glycol, TRANS., 579.
- — diacetate, TRANS., 579.
- — monoacetate, TRANS., 578.
- — monobenzoate, TRANS., 580.
- Acetal, amido-, condensation-products of, 624, 866.
- Acetaldehyde, action of unsymmetrical dialkylcarbamides on, 963.
- characteristic reactions for, 657.
- Acetaldehydoparabromophenylhydrazine, 251.
- Acetylphenylthiocarbamide, 624.
- Acetamide, 381, TRANS., 107.
- Acetamidobenzoic acid, ortho-, bromination of, 986.
- Acetamidobromonitroisobutylbenzene, 44.
- Acetamido-derivatives of the aromatic series, halogen-substituted, and their derived diazines, 134.
- Acetamidodimethylpyrimidine, 1004.
- Acetamidohydroxynaphthoquinone, 1197.
- Acetamidohydroxyquinone, 968.
- Acetamidoparatoluic acid, nitro-ortho-, 1066.
- Acetanilide, action of zinc chloride on, 971.
- influence of, on digestion, 533.
- metabolism of, in the human body, 289.
- Acetic acid, coefficient of diffusion of, 1047.
- — dibrom-, electrolysis of, 1056.
- — chloride, action of, on arsenic trioxide, 767.
- Acetobutyl alcohol, TRANS., 352.
- — preparation of, TRANS., 354.
- bromide, TRANS., 332.
- Acetocumidide, thio-, 771.
- Acetohexadecylanilide, 129.
- Acetohydrastineoxime, 908.
- Acetol, PROC., 156.
- Acetone and its homologues, condensation-products of, with phenol, 1187.
- chloropentabrom-, 854.
- decomposition of, with bleaching powder, 34.
- diamido-, platinochloride, 250.
- dichlorotetrabrom-, 853.
- dinitroso-, 34.
- estimation of, in methyl alcohol, 313.
- pentoxide, trithio-, 852.
- symmetrical dibrom-, 234.
- tetrachlor-, action of phenylhydrazine on, 1159.
- — symmetrical, 1136.
- — — action of phenylhydrazine on, 955.
- thiocyanate, 414.
- trithio-, 852.
- Acetone-ammonia, tetrachlor-, 1136.
- Acetone-chloroform, solid, and its derivatives, 689.
- Acetonehydrazine, dinitroso-, 34.
- nitroso-, 47.

- Acetonemethylphenylhydrazine, di-nitroso-, 48.  
 Acetoneparabromophenylhydrazine, 251.  
 Acetonephenylhydrazine, salts of, 1159.  
 Acetonitrile, heats of combustion and formation of, 812.  
 — trichlor-, hydration of, *Proc.*, 122.  
 Acetylacetone, 385.  
 — preparation of, from ethyl diacetosuccinate, 1139.  
 Acetylcarbamide, nitro-, 125.  
 Acetylphenyl sulphide, 489.  
 Acetoparadiethylaniline, 493.  
 Acetophenone, action of phosphorus pentachloride on, 984.  
 — bromo-, action of hydroxylamine on, 610.  
 — bromonitro- and nitro-derivatives of, 505.  
 — direct formation of, from benzene, 243.  
 — dispersive power of, 805.  
 — physiological action of, 1076.  
 — product of the action of nitric acid on, 49.  
 — thiocyanate, 413.  
 Acetophenonebenzophenylhydrazine, *TRANS.*, 615.  
 Acetopropyl acetate, 844.  
 — alcohol, *TRANS.*, 352, 357.  
 — — normal, 843.  
 — benzoate, 844.  
 — bromide, *TRANS.*, 357.  
 Acetotoluidide, amido-, 866.  
 — bromine-derivatives of, 134.  
 — metanitropara-, reduction-products of, 865.  
 Acetous fermentation, influence of artificial gastric juice on, 1227.  
 Acetovaleric acid, *w.*, *Proc.*, 142.  
 Acetoxybutyric trichloride, tertiary, 690.  
 Acetoxydide, thio-, 771.  
 Acetylacetone, action of ethylenediamine on, 851.  
 — action of metacresylenediamine on, 852.  
 — action of phenylhydrazine and hydroxylamine on, 57.  
 — action of the copper compound of, on carbonyl chloride, 235.  
 — and its homologues, preparation of, 850.  
 — sodium compound of, action of ethyl chlorocarbonate on, 377.  
 Acetylangelicylmethane, 850.  
 Acetylbenzilemonoximes, 612.  
 Acetylbenzilic acid, 885.  
 Acetylbenzophenylhydrazine, *TRANS.*, 614.  
 Acetylbenzoyl, 1170.  
 Acetylbenzylidenimide, 984.  
 Acetylbenzylidenephénylhydrazine, 1159.  
 Acetylbutyryl and its derivatives, 1138.  
 Acetylbutyrylmethane, 851.  
 Acetylcaproic acid, *w.*, *TRANS.*, 338.  
 Acetylcapronyl, 1138.  
 Acetylcarbinol, *Proc.*, 156.  
 — osazone of, *Proc.*, 156.  
 Acetylcarvacrol, 880.  
 Acetylcinnamylhydantoin, 705.  
 Acetylcitric anhydride, 768.  
 — action of aromatic amines on, 768.  
 Acetylcrotonyl, 1139.  
 Acetyldihydrodiacetylcapronamide, *TRANS.*, 341.  
 Acetyldihydrothiotoluidine, *TRANS.*, 230.  
 Acetyldihydroxythionaphthalene, 246.  
 Acetyldinitrotoluquinol, 970.  
 Acetylene-derivatives, conversion of, into ethylene-derivatives by direct addition of hydrogen, 878.  
 Acetylenedicarboxylic acid, reduction of, 878.  
 Acetylenedicarboxyldiazoacetic acid, 694.  
 Acetylenetetramethylureine, 126.  
 Acetylenetrimethylnitrodiureine, 126.  
 Acetylenediphenyldiamine, 1010.  
 Acetyl- $\alpha$ -ethylphenylhydrazine, 1158.  
 Acetylglycyl dibromothotoluidide, 135.  
 Acetylheptylmethane, 851.  
 Acetylhydroxybenzenesulphone, 245.  
 Acetylinole, 3', 712.  
 Acetyl- $\alpha$ -isoamylphenylhydrazine, 1159.  
 Acetylisobutylphenylhydrazine, 1159.  
 Acetylisobutyryl, 1138.  
 Acetylisopropylphenylhydrazine, 1159.  
 Acetylisovaleryl, 1138.  
 Acetylisoannilic acid, 863.  
 Acetylmesityl oxide, 850.  
 Acetylmethyl cyanide imido-, 683.  
 Acetylorthodimethyldihydroxythiobenzene, 246.  
 Acetylorthotolylthiocarbamide, *TRANS.*, 304.  
 Acetylparamidobenzylphthalimidine, 983.  
 Acetylparamidodiphenylmethane, 261.  
 Acetylphenylhydrazine,  $\alpha$ -, 1159.  
 Acetylphenylpseudohydantoin, 707.  
 Acetylphenyl semithiocarbazide, *TRANS.*, 303.  
 Acetylpipeidine, 903.  
 Acetylpropionylhydrazine, 1137.  
 Acetylpropionylhydrazoximes, 1138.  
 Acetylpropionylmethane, 851.  
 Acetylscopoletin, 255.  
 Acetyltetrahydro- $\alpha$ -naphthalbenzylamine, 1199.

- Acetyltetrahydro- $\beta$ -naphthabenzyl-amine, 1199.  
 Acetyltetraphenylpyrroline, 623.  
 Acetylthio- $\beta$ -dinaphthylamine, 51.  
 Acetyltricarballic anhydride, 238.  
 Acetyltrimethylene, 845.  
 Acids and bases, diffusion of, into one another, 1046.  
 — and metals, interaction of, PROC., 66.  
 — basicity of, method of estimating, 463.  
 — correspondence between the magnetic rotation and the refraction and dispersion of light by, TRANS., 751.  
 — determination of the basicity of, from the conductivity of their sodium salts, 327.  
 — fatty, elimination of carbonic anhydride from, by aid of sodium methoxide, 1126.  
 — free, in oils, 799.  
 — from butter, estimation of, 1037.  
 — iodine absorptions, combining weights, and melting points of, 318.  
 — unsaturated, of earth-nut oil, oxidation of, 1058.  
 — oxidation of, 375, 956.  
 — volatile, formation of, in the ammoniacal fermentation of urine, 431.  
 — from lycopodium, 1059.  
 — general method for the separation and volumetric estimation of, 75.  
 — ketonic, condensation of, with bi-basic acids, 1146.  
 — synthesis of, by the action of acid chlorides on propionitrile, 957.  
 — method of investigating the dissolution of metals in, TRANS., 361.  
 — of pig's bile, 422.  
 — of the sugar-group, reduction of, 1149.  
 — organic, constants of affinity of, and their relation to composition and constitution, 818.  
 — estimation of the coefficients of affinity of, 1103.  
 — reciprocal displacement of, 808.  
 — sulphonic, decomposition of in presence of phosphoric acid, 1200.  
 — unsaturated, action of methyl diazoacetate on, 694.  
 — regularities of the addition of halogen-compounds to, 1140.  
 — volumetric estimation of, 306, 795.  
 Acid-vapours, damage done to plants by, 795.  
 "Acid-yellow," 709.  
 Aconitic acid, TRANS., 235.  
 — action of bromine on, 588.  
 — triamide, 861.  
 Aconityl anil-anilide, TRANS., 237.  
 Aconitylanilcarboxylic acid, TRANS., 238.  
 Aconityltoluidocarboxylic acid, TRANS., 239.  
 Aconityltoluidotoluidine, TRANS., 239.  
 Acritol, 485.  
 Acrosazone,  $\alpha$ -, preparation of, 483.  
 Acrose, formation of, from formaldehyde, 483.  
 Acrose,  $\alpha$ -, 485.  
 Acrosone,  $\alpha$ -, 484.  
 Adapter for fractional distillation in a vacuum, TRANS., 359.  
 Adenine, amount of, in various organs, and in fresh and fermented yeast, 791.  
 — constitution of, 786.  
 — estimation of, 790.  
 Adipic acid, boiling points of, 691.  
 — thermochemistry of, 1097.  
 Adipocere, 433.  
 Affinity coefficients, determination of, 931.  
 — estimation of the coefficients of, of organic bases and acids, 1104.  
 — in absolute measure and Ostwald's constants of affinity, relations between, 932.  
 — selective chemical, 332.  
 Agar jelly, diffusion in, 817.  
*Ageratum mexicanum*, coumarin in, 644.  
 Agitating, apparatus for, 934.  
 Agriculture, loss and gain of nitrogen in, 71.  
*Agrostis stolonifera latifolia*, analyses of, 1078-1082.  
 Air, absorption of the gases of, by water at various temperatures, 935.  
 — atmospheric, analysis of, 209.  
 — baths, 754.  
 — compressibility of, at very high pressures, 8.  
 — dilatation and compression of, 460.  
 — estimation of carbonic anhydride in, 440, 651.  
 — estimation of carbonic oxide in, 1087.  
 — expired, poisonous action of, 629.  
 — of soils, percentage of carbonic anhydride in the, 1030.  
 — relation between potential difference and striking distance in, at different pressures, 806.  
 — sodium sulphate in the, 826, 945.  
 Albite, new formation of, in granitic orthoclase, 109.  
 Albumin, error in the detection of, 1252.  
 — estimation of, in urine, 88, 452.  
 — serum-, formation of, in the alimentary canal, 632.  
 — vegetable, carbohydrates as oxidation-products of, 1235.

- Albuminoïds, ethereal-derivatives of, 1224.
- Albuminoïds in plants, products of the decomposition of, 642.
- new reaction for, 1092.
- Albuminoïd-substances, gelatinous state of, 171.
- Albumoïd, 737.
- Albumose isolated from anthrax cultures, 1234.
- Albumoses, benzoyl-derivatives of, 1224.
- Alcohol, commercial, examination of, 552.
- detection of impurities in, 928.
- estimation of, in essential oils, 445.
- vapour, action of hot manganese dioxide on, 230.
- Alcoholic solutions, vapour-tensions of, 7.
- Alcohols, analysis of, 445.
- benzoyl-compounds of, 1152.
- molecular depression of the freezing point of benzene by, 933.
- polyhydric, combinations of benzaldehyde with, 116.
- secondary, with secondary radicles, boiling points of, 477.
- Aldehyde sulphites of organic bases, 234.
- Aldehyde-blue, 503.
- Aldehydegallactonic acid and its lactone, 857.
- Aldehydes, action of hydrogen phosphide on, 35.
- action of, on phenanthraquinone, &c., under the influence of sunlight, 405.
- behaviour of, towards sodium, 781.
- condensation-products of hydrazines with, 393.
- Aldine formation, 612.
- Algæ, manurial value of, 1085.
- Alimentary canal, human, digestion of beans in the, 1226.
- Alimentation of animals, influence of the consumption of water on, 287.
- Alkali lakes, American, waters of, 29.
- Alkaline aluminates, 213.
- Alkaloïd from tea, 416.
- from the cuttle fish, 421.
- volatile, in pepper, 298.
- Alkaloïds, artificial and natural, 729.
- from cod-liver oil, 63.
- occurring with cocaine, 628.
- of areca nut, 420.
- Alkyl bromides, relative stability of, 476.
- chlorides, preparation of, from alcohols, 687.
- Alkylanilines, action of chromic anhydride on, 971.
- Alkyleinchonic acids,  $\alpha$ -, 410.
- Alkyldiazoamido-compounds, synthesis of heterogeneous mixed, TRANS., 610.
- Alkyl- $\beta$ -naphthylamines, reduction of, 888.
- Alkylquinolines,  $\alpha$ -, 410.
- Allacite from Langban, 217.
- Allantoïn in ascitic fluid, 291.
- Allophanic acid, derivatives of, 964.
- Allophanylglycollic acid, 964.
- Allophanyllactic acid, 964.
- Allophanyl- $\alpha$ -lactic acid, 394.
- Allophanyltartaric acid, 965.
- Alloxan ammonium sulphite, 239.
- aniline sulphite, 239.
- compounds of, with pyrazolic bases, 517.
- dimethylamine sulphite, 239.
- ethylamine sulphite, 239.
- pyridine sulphite, 239.
- Alloys, 933.
- constitution of, 932.
- of lead, tin, zinc, and cadmium, TRANS., 677.
- of sodium and gold, TRANS., 670.
- tin-lead, sp. gr. and composition of, 1051.
- Allyl alcohol, oxidation of, 231.
- cyanide, constitution of, 686.
- iodide, action of hydriodic acid on, 766.
- Allylacetone, nitroso-, 1139.
- Allylamine, brom-, and its derivatives, 116.
- magnetic rotatory power of, TRANS., 697, 732.
- Allylasparagine,  $\beta$ -, 591.
- Allylcumenylthiocarbamide, 774.
- Allylene, action of alcoholic potash on, 360.
- liquefaction of, 1126.
- non-existence of, 840.
- Allylorthotolylthiocarbamide, TRANS., 622.
- Allylphenylhydrazine, unsymmetrical, 1161.
- Allylphenyltetrazone, 1161.
- Alumina, hydrated, 213.
- phosphorescent, sharp line spectra of, TRANS., 281.
- the phosphorescence of, TRANS., 280.
- Aluminium alkyls, molecular reductions of freezing points by, 37.
- and iron, estimation of, in presence of calcium and phosphoric acid, 188.
- and zirconium, separation of, 550.
- antimonate, 1124.
- calcium and magnesium, separation of, 652.
- chloride, action of sodium thio-sulphate on, 1108.
- — compounds of with nitric oxide and nitric peroxide, 834.
- — molecular weight of, 1113.
- ethyl, molecular weight of, 757.
- fluorides, double, 107.
- isoamyl, 37.

- Aluminium isoamyl, molecular weight of, 758.  
 — metaphosphate, 757.  
 — methyl, molecular weight of, 757.  
 — vapour-density of, 695.  
 — molecular weight of, TRANS., 531, 533.  
 — occurrence of, in vascular cryptogams, 182.  
 — phenyl, 243.  
 — propyl, 37.  
 — molecular weight of, 758.  
 — salts, detection of free sulphuric acid in, 648.  
 — subfluoride, 676, 677.  
 — sulphate, action of concentrated sulphuric acid on, 347.  
 — valency of, 571.  
 Aluminium-bronze, preparation of, by the electrolysis of cryolite, 676.  
 Alums, water of crystallisation of, 7, 331.  
 Alvine, 220.  
 Amalgams, electromotive force of, 2.  
 Amarine, reduction of, 1191.  
 Amides, action of potassium hypobromite on, 981.  
 — decomposition of, with alcohols, 380.  
 — formation of, from ethereal salts and ammonia, 335.  
 Amidines, 1004.  
 Amido-group, best method of eliminating, 606.  
 Amine vapours, dissociation of, TRANS., 656.  
 Amines, aromatic action of sodium hypobromite on, 139.  
 — correspondence between the magnetic rotation and the refraction and dispersion of light by, TRANS., 751.  
 — magnetic rotation of, TRANS., 691, 713, 728, 743.  
 — primary aromatic, behaviour of towards sulphur, 602.  
 Ammelide, formation of, 951.  
 Ammeline, 114.  
 — formation of, 951.  
 Ammonia and nitrous acid in potable water, 1234.  
 — and oxygen, eudiometric investigation with mixtures of, 1031.  
 — behaviour of phenolphthaleïn with, 746.  
 — coefficient of diffusion of, 1047.  
 — diffusion of, into hydrochloric acid, 1046.  
 — estimation of, by distillation, 1087.  
 — estimation of, in rain water, TRANS., 544.  
 — evolution of, from plants and vegetable soils, 1236.  
 — formation of, in arable soil, 1240.  
 Ammonia, nitrification of, 1239.  
 — oxidation of, by hydrogen peroxide, 939.  
 — protoxide of, 14.  
 — ready formed, estimation of, in manures, 649.  
 — volumetric estimation of, in ammonium salts, 75.  
 Ammoniocobaltic molybdate, 1116.  
 — tungstate, 1117.  
 — vanadate, 1117.  
 Ammoniovanadyl fluorides, 1123.  
 Ammonium bromide, magnetic rotatory power of, TRANS., 716.  
 — chloride, magnetic rotatory power of, TRANS., 712.  
 — chromates, 1117.  
 — dihydroxybenzoylbenzenesulphonic acid, 710.  
 — dimolybdate, 107.  
 — fluoroxymolybdates, 106.  
 — hydrofluoroxovanadate, octahedral, 214.  
 — hydrogen sulphate, magnetic rotatory power of, TRANS., 721, 745.  
 — imidosulphonate, 211.  
 — iodide, magnetic rotatory power of, TRANS., 718.  
 — malonates, 857.  
 — nitrate, magnetic rotatory power of, TRANS., 721, 745.  
 — orthobenzaminesulphonate, 709.  
 — potassium sulphite, 1106.  
 — salts, correspondence between the magnetic rotation and the refraction and dispersion of light by, TRANS., 751.  
 — magnetic rotatory power of, TRANS., 742.  
 — selenosamate, 103.  
 — sulphate and sodium nitrate, comparative manurial value of the nitrogen of, 436, 1085.  
 — sulphate, magnetic rotatory power of, TRANS., 722, 745.  
 — sulphites, 1106.  
 Amphibole, solubility of, in sea water, 682.  
 Amygdalin, action of emulsin on, 466.  
 Amyl nitrite, physiological action of, 433.  
 — nitrites, the metameric, 365.  
 —  $\alpha$ -truxillate, 1194.  
 Amylbenzene, 127.  
 Amylbenzyl cyanide, 862.  
 Amydibromopropylamine hydrobromide, 118.  
 Amylene from tertiary amyl iodide, 1127.  
 — nitrosate and its derivatives, 233.  
 Amylenenitrolpiperidide, 234.  
 Amylodextrin, action of diastase on, TRANS., 456.  
 — and its relation to soluble starch, TRANS., 449.

- Amylodextrin, constitution and molecular weight of, *TRANS.*, 454.  
 ——— properties of, *TRANS.*, 452.  
 Analysis, elementary, 1248.  
 ——— of volatile liquids, 1088.  
 ——— testing of the reagents employed in, 1085.  
 ——— organic, modifications in the methods of, 190.  
 ——— wet methods of, 80.  
 ——— quantitative, by electrolysis, 76.  
 ——— ultimate, calorimetric bomb as a combustion furnace for, 301.  
 ——— use of hydrogen peroxide in, 546.  
 Anderbergite, 220, 221.  
 Andrometoxin, 278.  
 ——— in the Ericaceæ, 644.  
 Angelic acid, constitution of, 587.  
 ——— dibromide, 587.  
 ——— oxidation of, 374.  
 Anhydrite and gypsum, relative rates of dissolution of, 466.  
 Anhydrodiacetylacetamidil, 1004.  
 Anhydrodiacetylacetamidine, 1004.  
 Anhydroecgonine, 168, 169.  
 ——— conversion of, into pyridine, 909.  
 ——— hydrochloride, specific rotatory power of, 1018.  
 Anhydroformylorthamidoparatoluyamide, 1065.  
 Anhydroglucometaparadiamidotoluene, 484.  
 Anilbenzil, 147.  
 Anilidiphenylguanidine, 393.  
 Anilic acids, chlor-, brom-, and nitro-, 390.  
 ——— constitution of, 497.  
 Anilidodiphenamic amide, 145.  
 Anilidoethyldiphthalamie acid, 1167.  
 Anilidoethylphthalamie acid, 1166.  
 Anilidoethylphthalimide,  $\beta$ -, 1166.  
 Anilidopropionic anilide,  $\alpha$ -, 1012.  
 Anilidosuccinic acid, derivatives of, 1064.  
 Aniline arsenious bromide, 211.  
 ——— chlorate, 497.  
 ——— diazotised metanitr-, action of, on ethylparabromaniline, *TRANS.*, 428.  
 ——— ——— action of, on methylparabromaniline, *TRANS.*, 425.  
 ——— diazotised parabrom-, action of, on ethylmetanitr-aniline, *TRANS.*, 428.  
 ——— ——— action of, on ethylparanitr-aniline, *TRANS.*, 423.  
 ——— ——— action of, on methylmetanitr-aniline, *TRANS.*, 426.  
 ——— ——— action of, on methylparanitr-aniline, *TRANS.*, 419.  
 ——— ——— action of, on methylparatoluidine, *TRANS.*, 432.  
 ——— diazotised parachlor-, action of, on methylparatoluidine, *TRANS.*, 436.  
 Aniline diazotised paranitr-, action of, on ethylparabromaniline, *TRANS.*, 423.  
 ——— ——— action of, on methylbromaniline, *TRANS.*, 418.  
 ——— dichromate, heat of formation of, 562.  
 ——— dispersive power of, 805.  
 ——— estimation of, 1037.  
 ——— last runnings obtained in the purification of, 600.  
 ——— nitroso-, phenylmethylhydrazone of, 702.  
 ——— perchlorate, 497.  
 Aniline-blue, theory of the formation of, 503.  
 Anilinesulphonic acid, orthonitro-, and its derivatives, 144.  
 Anilopropionic acid, 707.  
 Anilosuccinic acid, 707.  
 Animal chromatology, 1231.  
 ——— gum in normal urine, 293.  
 ——— tissues, attraction of, for sulphur, 633.  
 Animals, influence of light on oxidation in, 172.  
 ——— influence of the consumption of water on the alimentation of, 287.  
 ——— secretion of lime by, 429.  
 ——— starving and normal, the relation of water and solid constituents in the organs and tissues of, 632.  
 Anisaldehyde, melting point of, *TRANS.*, 551.  
 Anisaldehydephenylhydrazone, 252.  
 Anise, oil of, 659.  
 Anisic compounds, melting points of, *TRANS.*, 549.  
 Anisidioximes,  $\alpha$ - and  $\beta$ -, 512.  
 Anisiloxime, 513.  
 Anisylcocaine, 149.  
 Anisylecgonine, 419.  
 Anthracene, action of nitric acid on, *PROC.*, 13.  
 ——— diamido-, *PROC.*, 13.  
 ——— heats of combustion and formation of, 1042.  
 ——— molecular volume of, 336.  
 ——— nitro- and dinitro-, *PROC.*, 13.  
 Anthranol, propyl-derivatives of, 894.  
 Anthrarobin, physiological action of, 539.  
 Anthrax cultures, albumose isolated from, 1234.  
 Antidimethylsuccinic acid, 490.  
 Antifebrin, detection of, in phenacetin, 660.  
 ——— influence of, on digestion, 533.  
 Antimonates, Swedish, 218.  
 Antimonic acid, basicity of, 1123.  
 ——— volumetric estimation of, 312, 444.  
 Antimonious acid, volumetric estimation of, 311.

- Antimonious chloride, action of sodium thiosulphate on, 1109.
- Antimony and arsenic, separation of, 926.
- and tin, separation of, 77.
- detection of, in minerals, 444.
- estimation of, in organic compounds, 81.
- estimation of, in tartar emetic, 445.
- hydride, heat of formation of, 666.
- influence of, on the glycogenic function and fatty degeneration of the liver, 537.
- molecular weight of, *TRANS.*, 532, 533.
- pentachloride, compounds of, with nitric oxide and nitric peroxide, 834.
- potassium oxalate, 489.
- sulphide, decomposition of, by boiling water, 108.
- vapour-density of, 673.
- Antipyrin, influence of, on digestion, 533.
- Antiseptic action of bile acids, 291.
- Apatite from Pisek, 837.
- from Yonkers, New York, 24.
- Apiole, 407.
- Apionacrylic acid, 407.
- Apoharmine, 731.
- Aqueous humour, 535.
- — presence of sugar in, 177.
- Arabinose, birotation of, 1132.
- fermentation of, 480.
- formation of, from malt residues, 480.
- formation of furfuraldehyde and non-formation of levulinic acid from, 480.
- formation of furfuraldehyde as a test for, 480.
- molecular weight of, 367.
- oxidation of, with nitric acid, 32.
- reducing value of, with Fehling's and Sachsse's solutions, 1132.
- Arabinosecarboxylic acid, reduction of, 1149.
- Aragonite pseudomorph, 25.
- zinc bearing, from Tarnowitz, 763.
- Araucarias, oleo-gum-resin secreted by, 1236.
- Archil, test for, in wine, 655.
- Areca nut, alkaloïds of, 420.
- Arecaïne, 421.
- Arecoline, 420.
- Arganin, 160.
- Aromatic boron and silicon compounds, 505.
- compounds, isomeric changes occurring in the synthesis of, by means of aluminium chloride, 127.
- — new general method for the synthesis of, 241.
- Aromatic cyanates and their polmerides, 241.
- selenium compounds, synthesis of, 41.
- Arrhenatherum avenaceum*, analyses of, 1078-1082.
- Arsenates, alkaline, action of, on the alkaline earths, 826.
- Arsenic acid, action of hydrogen sulphide on, 15.
- allotropic, 211.
- and antimony, separation of, 926.
- detection of minute quantities of, 650.
- estimation of, in organic compounds, 81.
- in bone phosphate used for cattle feeding, 548.
- in glass and in alkali hydroxides, 341.
- influence of, on the glycogenic function and fatty degeneration of the liver, 537.
- trioxide, action of acid chlorides on, 767.
- vapour-density of, 674.
- Arsenioleite, a new Swedish mineral, 22.
- Arsenious acid, action of sodium thiosulphate on, 1109.
- bromide, action of ammonia and amines on, 211.
- anhydride, compounds of, with sodium bromide and iodide, 103.
- — compounds of, with sulphuric anhydride, *TRANS.*, 157.
- — solubility of, 945.
- — volumetric estimation of, 311.
- sulphide, solubility of, 945.
- Arsenopyrite, constitution of, 216.
- from Servia, 21, 215.
- Arterin, 787.
- Ascitic fluid, sugar and allantoin in, 291.
- Ash, estimation of, 80.
- Ashes, plant, estimation of chlorine in, 73.
- Asparagine in dahlia bulbs, 433.
- inactive, 382, 384.
- Asparagines, constitution of, 383.
- substituted, 591.
- synthesis of, 381.
- Assimilation of milk sugar, 735.
- of plants, rôle of formaldehyde in, 640.
- of the phosphoric acid of basic slag, 647.
- Astrophyllite in a rock from Colorado, 1054.
- Atmid-albumin, 910.
- Atmid-albumose, 911.
- Atomic weight of chromium, *TRANS.*, 213.
- — of nickel and cobalt, 759.

Atomic weight of oxygen, 672, 935.  
 — of ruthenium, 352, 835.  
 — of tellurium, TRANS., 382.  
 — of tin, 19.  
 — of zinc, TRANS., 443.  
 — weights, basis of, 819.  
 — numerical relations of, 567.  
 — of carbon and oxygen with reference to Prout's law, 463.  
 — of the elements, 1104.  
 — standard of, 335.  
 — unit of, 753, 819, 932.  
 Atoms, arrangement of, in space, 236, 261, 576.  
 — unstable equilibrium of, 672.  
 Atropic acid, heat of combustion of, 460.  
 Atropine and hyoscyamine, relations between, 167.  
 Auerlite, a new thorium mineral, 221.  
 Australene, 616.  
 Autoxidation, 937, 1106.  
 Avenine, existence of, P, 1223.  
 Azelaic acid, action of bromine on, 375.  
 — boiling points of, 691.  
 — thermochemistry of, 1097.  
 Azimidobenzene, bromo-, 501.  
 — trichlorobromo-, 502.  
 Azimido-compounds, 501.  
 Azo- and diazo-derivatives, constitution of, TRANS., 114.  
 Azobenzene, dinitroso-, 1160.  
 — nitronitroso-, 1161.  
 — nitrosodinitro-, conversion of tri-nitrohydrazobenzene into, 977.  
 Azobenzenecetacetamide, 864.  
 Azobenzenecyanacetophenone, 873.  
 Azobenzenedisulphonic acid, from "acid-yellow," 709.  
 Azobenzeneorthomethylcyanacetophenone, 874.  
 Azobenzeneparasulphonic acid, ortho-nitro-, 881.  
 Azobenzenesalicylaldehyde, 780.  
 Azobenzenesalicyl alcohol, 780.  
 Azobenzenesalicylamide, 780.  
 Azobenzenyl peroxide, 980.  
 Azobenzoic acids, action of alcohol on, 675.  
 — mono-, and di-nitropara, 141.  
 Azo-compounds of the fatty series, constitution of, 586.  
 Azodiacetamidotoluene, 865.  
 Azodihydroxyquinoline, 519.  
 Azo-dyes of the naphthalene series, reduction of the, 270.  
 Azo-group, substitution of, for ketonic oxygen, 1157.  
 Azoles, 413.  
 Azometaxylene, unsymmetrical and symmetrical, 136.  
 Azonaphthalenesalicylic acids,  $\alpha$ - and  $\beta$ -, 780.

Azo- $\beta$ -naphthol, constitution of, 404.  
 Azo- $\beta$ -naphthol-compounds, alkyl-derivatives of, TRANS., 603.  
 — benzoyl-derivatives of, TRANS., 114.  
 Azo- $\beta$ -naphthol-derivatives containing acid radicles, reduction of, 117.  
 Azonaphthols, TRANS., 603.  
 Azo- $\beta$ -naphthylamines, constitution of, 404.  
 Azonitrobenzeneacetosalicylic acid, 780.  
 Azonitrobenzenesalicylic acid, 780.  
 Azoparaxylene, 136.  
 Azortho-xylene, consecutive, 135.  
 — unsymmetrical, 136.  
 Azotoluene, dinitrometa-, 701.  
 — nitro-derivatives of, 251.  
 — ortho-, nitro-derivatives of, 501.  
 — para-, 250.  
 Azoxyacetamidotoluene, 865.  
 Azoxybenzoylformic acid, para-, 506.  
 Azo-xylene, and colouring matters derived therefrom, 135.  
 Azoxyparatolunitrile, ortho-, 1065.  
 Azoxytoluene, meta-, 701.  
 Azoxytoluenes,  $\alpha$ -, and  $\beta$ -, and their bromo- and nitro-derivatives, 865.  
 — two isomeric, 392.  
 Azoxytoluenesulphonic acid, 392.

## B.

Bacillus from *Erythema nodosum*, chemical composition of, 539.  
 — *tuberculosis*, composition of, 638.  
 Bacterio-purpurin, 180.  
 Balance, voltaic. See Voltaic balance.  
 Balsam of Peru, testing, 196.  
 Barium acetohyponitrite, 945.  
 — arsenates, 826.  
 — cobaltite, 1115.  
 — caproate, solubility of, 122.  
 — carbuvate, 593.  
 — ferricyanide and bromide, 951.  
 — hydroxyhexanedisulphonate, 121.  
 — malonate, heat of formation and dissolution of, 958.  
 — molecular weight of, TRANS., 530, 533.  
 — oxyamidosulphonate, TRANS., 764.  
 — platinitite, 1125.  
 — sulphate, dimorphism of, 838.  
 — — precipitation of, in presence of bromine, 187.  
 — — reduction of, to barium sulphide on ignition with filter paper, 1032.  
 — sulphite, 16.  
 — strontium and calcium, separation of, 77.  
 — uvate, 593.



- Barley, manuring of, 743.  
 Baryo-celestine from Werfen in Salzburg, 22.  
 Basalt from the Dachberg, a volcano of the Rhone, 110.  
 — origin of primary quartz in, 26.  
 Base containing chromium and carbamide, 695.  
 — volatile, from the root of *Cephalis ipecacuanha*, 918.  
 Bases and acids, diffusion of into one another, 1046.  
 — hydrogenised, relations between the physiological properties and constitution of, 737.  
 — organic, estimation of the coefficients of affinity of, 1104.  
 Basicity of acids, determination of the, from the conductivity of their sodium salts, 327.  
*Bassia latifolia*, juice of, 434.  
 Bat's guano from Cuba, 436.  
 Batteries, two-fluid, 89.  
 Bay oil, 1072.  
 Beans, digestion of in the human alimentary canal, 1226.  
 — fat from, 295.  
 Beech, wood of the, 1084.  
 Beer, detection and estimation of salicylic acid in, 195.  
 — detection of "saccharin" in, 322.  
 — detection of salicylic acid in, 446.  
 Bees, larval, food of, 1022.  
 Beet and fruit syrups, discrimination of, 1089.  
 — estimation of sugar in, by digestion in water, 314.  
 — growth of, at Grignon in 1888, 542.  
 — indirect analysis of the, 314.  
 — rare constituents of the ash of, 295.  
 Behenic acid, conversion of erucic acid into, 1140.  
 Bementite, from Franklin, New Jersey, 473.  
 Benzalacetone, nitroso-, 585.  
 Benzalazine, 393.  
 — orthonitro-, 393.  
 Benzaldehyde, action of hypophosphorous acid on, 141.  
 — action of phosphonium iodide on, 1168.  
 — compounds of, with polyhydric alcohols, 116.  
 — condensation-products of, with phenol and thymol, 1188.  
 — derivatives of, 983.  
 — dispersive power of, 805.  
 — paranitro-, condensation of, with quinaldine, 527.  
 — paranitro- and metanitro-, condensation-products of, with bases of the para-series, 132.  
 Benzaldoximes,  $\alpha$ - and  $\beta$ -, 607.  
 — isomerism of the, 979.  
 — oxidation of, 980.  
 Benzalimide, 983.  
 Benzamarone, formation of, 265.  
 Benzamide, action of sodium hypobromite on, 139.  
 — metamido-, and its derivatives, 778.  
 Benzamidine chloracetate, 1006.  
 — ethyl oxalate, 1009.  
 — pyruvate, 1005.  
 — trichlorolactate, 1006.  
 Benzamidine-chloral, 1005.  
 Benzamidinethiocarbamide, 1005.  
 Benzamidoazophenol, meta-, 778.  
 Benzene, action of nitric anhydride on, 341.  
 — action of sulphur on, in presence of aluminium chloride, 242.  
 — boiling point of, TRANS., 487.  
 — bromo- and chloro-, dispersive power of, 805.  
 — — boiling point of, TRANS., 487.  
 — — sp. gr. and sp. vol. of, TRANS., 488, 506.  
 — — vapour-pressure of, TRANS., 490, 497, 503, 509.  
 — chloro-, boiling point of, TRANS., 487.  
 — — sp. gr. and sp. vol. of, TRANS., 488, 505.  
 — — vapour-pressure of, TRANS., 490, 495, 502, 509.  
 — constitution of, 1061, 1176.  
 — dispersive power of, 805.  
 — expansion of, TRANS., 519.  
 — estimation of, in coal-gas, 190.  
 — fluoro-, boiling point of, TRANS., 487.  
 — — specific volume and sp. gr. of, TRANS., 488, 505.  
 — — vapour-pressure of, TRANS., 493, 490, 502, 509.  
 — heats of combustion and formation of, 1042.  
 — iodo-, boiling point of, TRANS., 487.  
 — — sp. gr. and sp. vol. of, TRANS., 488, 506.  
 — — vapour-pressure of, TRANS., 490, 498, 503, 510.  
 — iodoxydiiodo-, 1150.  
 — molecular depression of the freezing point of, by alcohols, 933.  
 — molecular depression of the freezing point of, by phenols, 101.  
 — molecular volume of, 336.  
 — nitration of, 387.  
 — nitration of, as a non-reversible chemical change, 10.  
 — nitro-, action of zinc ethyl on, 113.

- Benzene, nitro-, detection of, in presence of oil of bitter almonds, 552.  
 ———— dispersive power of, 805.  
 ———— paradichloroparadinitroso-, 245.  
 ———— physical properties of, 387.  
 ———— specific volume and sp. gr. of, TRANS., 488, 504.  
 ———— tetramido, consecutive, 974.  
 ———— ———— symmetrical, 604.  
 ———— tetrabromodinitro-, 696.  
 ———— 1 : 3 : 4 : 5-tetrachloro-, new francein from, 970.  
 ———— triamido-, oxidation-product of, 700.  
 ———— vapour in coal-gas, estimation of, 1036.  
 ———— vapour-pressure of, TRANS., 492, 501, 508.  
 Benzeneazo- $\alpha$ -chloronaphthalene,  $\beta$ -, 267.  
 Benzeneazo- $\beta$ -naphthol, reduction of, TRANS., 122.  
 Benzeneazo- $\alpha$ -naphthyl acetate, nitration of, TRANS., 609.  
 ———— benzoate, TRANS., 606.  
 ———— ethoxide, nitration of, TRANS., 608.  
 Benzeneazo- $\beta$ -naphthyl acetate, nitration of, TRANS., 609.  
 ———— ———— reduction of, TRANS., 117, 122.  
 ———— ———— benzoate, TRANS., 115.  
 ———— ———— metanitro-, TRANS., 116.  
 ———— ———— reduction of, TRANS., 124.  
 ———— ———— ethoxide, nitration of, TRANS., 608.  
 Benzene-derivatives of high molecular weight, 129.  
 ———— ———— oxidation of, with potassium ferricyanide, 394, 711.  
 Benzenediazoamidoparatoluene, parabromo-, methylation of, TRANS., 433.  
 ———— ———— parachloro-, methylation of, TRANS., 437.  
 Benzenehomophthalopropylimide, nitro-, 256.  
 Benzenemetadisulphonetetrabromamide, 981.  
 Benzene-nucleus, destruction of, in the body, 289.  
 Benzenesulphonic acid, paranitromet-amido-, derivatives of, 708.  
 Benzenylamidoxime, 1064.  
 ———— ethyl ether, 1064.  
 Benzenyldiphenylhydrazine, 392.  
 Benzenyldiureide, 1005.  
 Benzhydrol benzilate, 886.  
 ———— diamido-, 781.  
 Benzhydrol-derivatives, new method of formation of, 263.  
 Benzhydroxamic acid, preparation of, 870.  
 Benzdine, dyes derived from, 1152.  
 ———— hydrochlorides, decomposition of, by water, 260.  
 Benzile, action of  $\alpha$ - and  $\beta$ -benzylhydroxylamine on, 1193.  
 ———— action of primary aromatic amines on, 147.  
 Benzilebromisobutylbenzene, 45.  
 Benziledihydrazone, action of heat on, 51.  
 Benziledioxime,  $\gamma$ -, and its derivatives, 713.  
 Benziledioxime dimethyl ether, isomeric forms of, 403.  
 Benziledioximes, benzyl-derivatives of, 609.  
 ———— isomerism of, 403.  
 Benziledioximes  $\alpha$ - and  $\beta$ -, intramolecular change of, 1067.  
 Benzilemonoxime,  $\alpha$ -, intramolecular change of, 1067.  
 Benzilemonoxime, reduction of, 613.  
 Benzilemonoximes, isomeric, structure of the oximido-group in, 1192.  
 ———— two isomeric, 611.  
 Benziies, 512.  
 Benzilic acid, 885.  
 ———— ———— derivatives of, 885, 999.  
 ———— ———— amide, 886.  
 Benzilide, 885.  
 Benzilisobutylphenazine, 44.  
 Benzoic acid, direct preparation of, from benzene, 242.  
 ———— ———— halogen-derivatives of, 985.  
 ———— ———— heats of combustion and formation of, 1096.  
 ———— ———— preparation of, 874.  
 ———— ———— specific heat of, 93, 94.  
 ———— ———— acids, chlorobromo-, 985.  
 ———— ———— anhydride, metanitro-, 779.  
 ———— ———— bromamide, 981.  
 ———— ———— bromamides, ortho-, meta-, and paranitro-, 982.  
 ———— ———— chloride, action of, on arsenic trioxide, 767.  
 Benzoindole, TRANS., 617.  
 Benzoindolecarboxylic acid, TRANS., 617.  
 Benzonitrile, action of sodium hypobromite on, 139.  
 ———— ———— heats of combustion and formation of, 812.  
 Benzophenone, action of sodium on, 781.  
 ———— ———— diamido-, 781.  
 ———— ———— oxime, parachloro-, and intramolecular change of, 1066.  
 ———— ———— tetranitrodiamido-, 147.  
 Benzophenylacetone hydrazine, TRANS., 615.  
 Benzophenyl-benzaldehyde hydrazine, TRANS., 615.  
 Benzophenyldihydroketometadiazine, 973.

- Benzophenyldihydrothiometadiazine, 973.  
 Benzophenylhydrazine, TRANS., 612.  
 — action of chloroform and alcoholic potash on, TRANS., 618.  
 Benzophenylhydrazinepyruvic acid, TRANS., 616.  
 Benzophenyl-phenyl thiosemicarbazide, TRANS., 615.  
 Benzophenylsemicarbazide, TRANS., 614.  
 Benzoylbutyric trichloride, tertiary, 690.  
 Benzoxycarbamide, 501.  
 Benzoylterephthalic acid, 1181.  
 Benzoyl carbinol, paranitro-, 505.  
 Benzoyl- $\delta$ -amidocaproic acid, 904.  
 Benzoylbenzamide, 1005.  
 Benzoylcaproic acid,  $\omega$ -, TRANS., 350.  
 — oxime of, TRANS., 351.  
 Benzoylcumylamine, 773.  
 Benzoyldiamidohydroxynaphthylphenyl TRANS., 125.  
 Benzoylcegonine, preparation of, 168.  
 Benzoylenecarbamide, 609.  
 Benzoylethyl cyanide,  $\alpha$ -, 577.  
 — imido-, 577.  
 Benzoyl- $\alpha$ -ethylisosuccinic acid,  $\beta$ -, 257.  
 Benzoyl- $\alpha$ -ethylpropionic acid,  $\beta$ -, 257.  
 Benzoylmetamidobenzamide, metamido-, 779.  
 — metanitro-, 779.  
 Benzoylmethyl cyanide, imido-, 683.  
 Benzoylphenylcarbamide, 1005.  
 Benzoylphenylenediphenylmethane, 882.  
 Benzoylphenylethylthiocarbamide, TRANS., 305.  
 Benzoylphenylhydrazine,  $\alpha$ -, 1160.  
 — paranitro-, 507.  
 Benzoylphenylsemithiocarbazide, TRANS., 304.  
 Benzoylpipecoline, 904.  
 Benzoylscopoletin, 256.  
 Benzoyltrihydroxybenzamidopyrrolone, 1210.  
 Benzyl acetate, action of chlorine and bromine on, 598.  
 — reactions of, 598.  
 — alcohol, dispersive power of, 805.  
 — orthamido-, acetyl-derivatives of, 972.  
 — alcohols, para-chloro-, and bromo-, derivatives of, 247.  
 — allophanate, 393, 964.  
 — cyanide, condensation of, with aldehyde, and with amyl nitrite and its substitution-products, 597.  
 — heats of combustion and formation of, 812.  
 — replacement of the methylene hydrogen-atoms in, 596, 861.  
 Benzyl cyanides, ortho- and para-, metallic derivatives of, 507.  
 — substituted, 597.  
 — ether, metanitro-, orthonitro-, and paranitro-, 248.  
 — parabromo- and parachloro-, 248.  
 — methyl ketone, bromodinitro-, 781.  
 — phenylallophanate, 394, 964.  
 — series, compounds of, 982.  
 — sulphide, platinum compounds of, 368.  
 — tricarballoylate, 238.  
 Benzylacetamide, paranitro-, 982.  
 Benzylamidobenzeneazo- $\alpha$ -naphthol, TRANS., 596.  
 Benzylamidobenzeneazo- $\beta$ -naphthol, TRANS., 596.  
 Benzylamine hydrochloride, paranitro-, 982.  
 — paramido-, 982, 1174.  
 Benzylammonium hydrogen succinate, TRANS., 628.  
 — succinate, normal, TRANS., 628.  
 — succinates and their derivatives, TRANS., 627.  
 Benzylamylbenzyl cyanide, 862.  
 Benzylbenzaldoximes,  $\alpha$ - and  $\beta$ -, 607, 608.  
 Benzylbenzilemonoxime, 609.  
 Benzyl- $\alpha$ -benziloxime, 1192.  
 Benzyl- $\beta$ -benziloxime, 1193.  
 Benzyl- $i$ -benziloxime, 1194.  
 Benzylbenzoylamide, paranitro-, 982.  
 Benzylbenzylidenediamidophenylamine, TRANS., 594.  
 Benzylbromazimidobenzene, 502.  
 Benzylcarbamide, paranitro-, 982.  
 Benzyldimethylhydroxypyrimidine, 1008.  
 Benzylidiphenylacetic acid, 597.  
 Benzylidiphenylacetoneitrile, 597.  
 Benzylidurene, preparation of, 966.  
 Benzyleneindole, ortho-, 1172.  
 Benzylethylsuccinic acid, symmetrical, 959.  
 Benzylhydratropic acid, 596.  
 Benzylhydratropionitrile, 596.  
 Benzylhydroxylamine,  $\beta$ -, 704.  
 Benzylhydroxylamine, derivatives of, 500.  
 Benzylhydroxylamines,  $\alpha$ - and  $\beta$ -, 608.  
 Benzylhydroxypyrimidinecarboxylic acid, 1008.  
 Benzylideneallylphenylhydrazine, 1161.  
 Benzylidenebenzamidine, 1005.  
 Benzylidenecarbaminethioglycollic acid, 960.  
 Benzylidenecarbimidoacetic acid, 960.  
 Benzylidenedicyanophenylhydrazine, 702.  
 Benzylidenediisopropylindole, 401.  
 Benzylidenediketohydrindene, 1068.

- Benzylideneethylphenylhydrazine, 1158.  
 Benzylidenequinaldine, amido-, 528.  
 Benzylisobenzaldoxime, constitution of, 979.  
 Benzylmetaphenylenediamine, TRANS., 597.  
 Benzylmeta- and benzylpara-phenylenediamine, oxidation of a mixture of, TRANS., 598.  
 Benzylmethylethylhydroxypyrimidine, 1008.  
 Benzylmethylhydroxypyrimidine, 1007.  
 Benzylparaphenylenediamine, TRANS., 591.  
 — azo-, and diazo-derivatives of, TRANS., 596.  
 — oxidation of, in the presence of other aromatic amines, TRANS., 592.  
 Benzylphenylhydrazine,  $\alpha$ -, 1159.  
 Benzylphenylhydroxypyrimidine, 1008.  
 Benzylphenylindole, 2' : 3', 260.  
 Benzylphosphinic acid, 1168.  
 — nitro-, 1168.  
 Benzylphthalimide, paranitro-, 982, 1174.  
 Benzylphthalimidine, paramido-, 982.  
 Benzylpiperidine, di-paranitro-, 903.  
 Benzylpropylbenzyl cyanide, 862.  
 Benzyl- $\alpha$ -quinoline, para-, 261.  
 Benzyltolylphenylacetoneitrile, 597.  
 Benzylurethane, 393.  
 Benzyl-violet, manufacture of, 609.  
 Berberine, 627, TRANS., 63.  
 — action of fused potash on, TRANS., 88.  
 — action of hydrogen iodide on, TRANS., 86.  
 — constitution of, 168.  
 — hydriodide, TRANS., 66.  
 — hydrochloride, TRANS., 70.  
 — nitrate, TRANS., 65.  
 — oxidation of, TRANS., 70.  
 — platinochloride, TRANS., 68.  
 — properties of, TRANS., 68.  
 Berberinic acid, 627.  
 Bertrandite from Mt. Antero, Colorado, 24.  
 — from Pisek, 471.  
 Beryl, analyses of, 356.  
 Beryllium, additional proof of the bivalence of, TRANS., 650.  
 — silicates, 104.  
 Beryllonite, 355, 470.  
 Berzeliite, 217.  
 Betaine, presence of, in the seeds of *Vicia sativa*, 1029.  
 Betel oil, 863.  
 Betelphenol and its derivatives, 863.  
 Bethabarra wood, occurrence of lapachic acid in, 794.  
 Bidesyls, 623.  
 — action of ammonia on, 162.  
 Biguanide, derivatives of, 951.  
 Bile acids, antiseptic action of, 291.  
 — hæmoglobin and its derivatives in, 1231.  
 — human, 792.  
 — oxyhæmoglobin in, 636.  
 — pig's, a crystalline acid from, 1231.  
 — acids of, 422.  
 — spectroscopic character of, 636.  
 Biliary acids in the urine during jaundice, 637.  
 Bismuth, amorphous, 572.  
 — characteristic reaction for, 79.  
 — chloride, compounds of, with nitric oxide and peroxide, 834.  
 — compounds, aromatic, 1061.  
 — electrical resistance of, 807.  
 — molecular weight of, TRANS., 532, 533.  
 — vapour-density of, 673.  
 Bismuthous oxide, cubical form of, TRANS., 143.  
 Bis-phenylmethylmethylenepyrazolone, PROC., 142.  
 Biuret dicyanodiamide, 951.  
 Bleaching powder, preparation of chlorine from, 821.  
 Blood, amount of hæmoglobin in, during inanition, 531.  
 — amount of urea in, 914.  
 — coagulation of the, 288, 1076.  
 — estimation of the alkalinity of, 449.  
 — human, detection of, 1092.  
 — in carbonic oxide poisoning, new test for, 88.  
 — lactic acid in, 64.  
 — new test for carbonic oxide poisoning in, 650.  
 — passing to and from the liver and spleen, hæmoglobin in, 1023.  
 — peptone-, gases of, 531.  
 — pigments, 787.  
 — production of the proteids of, 532.  
 — the stromata of the red corpuscles of, 1231.  
 — Van Deen's test for, 1040.  
 Blood-pressure, action of hydroxylamine and nitrites on, 630.  
 Blood-tablets and thrombosis, 427.  
 Boiling point, determination of the molecular weight from the rise of the, 933.  
 Boiling points, 813.  
 Bone phosphate used for cattle feeding, arsenic in, 548.  
 Boric acid as a plant constituent, 794.  
 — compound of, with sulphuric anhydride, TRANS., 155.  
 — occurrence of, in wine and in the vine, 295.  
 — volumetric estimation of, 75.

Borneol, dextro-, preparation of a, identical with Dryobalanops borneol, 1002.  
 — separation of camphor from, 1002.  
 — specific volume of, 785.  
 Borneols, heats of combustion of, 328.  
 Boron, combustion of, in dried oxygen, 465.  
 — compounds, organic, 769.  
 — oxychloride, composition of, 465.  
 — preparation of, 211, 343.  
 — preparation of, by electrolysis, 103.  
 — trichloride, preparation of, 343.  
 — triphenyl, 505.  
 — valency of, 465.  
 Bournonite, decomposition of, by air containing bromine, 1243.  
*Brachypodium sylvaticum*, analyses of, 1078-1082.  
 Brahinite, new specimen of, 765.  
 Brandies, natural, analysis of, 84.  
 Brandy distillation, glycerol in the residuary liquors of, 735.  
 Brassidic acid, boiling points of, 691.  
 Brazilin, 55, 1004.  
 — bromo-derivatives of, 1004.  
 — dibromide, tribromo-, 56.  
 Breunerite from the Central Ural, 837.  
 Bromic acid, study of the action of hydriodic acid on, 9.  
 Bromides, can the mucous membrane of the stomach decompose, 426.  
 Bromine, chlorine, iodine, and cyanogen, separation and estimation of, 304.  
 — detection of, in organic compounds, 796.  
 — estimation of, in sea-water, 74.  
 — use of in the analysis of sulphides, 1243.  
 Bromochromic acid, non-existence of, 678.  
 Bromomeric acid, 1050.  
 Brucine, separation of strychnine from, 748.  
 — specific rotatory and refractive powers of, 453.  
 Butines, 361.  
 Butter analysis, 192, 801.  
 — modification of the Reichert-Meissl method of, 85.  
 — detection of adulterations in, 658.  
 — detection of margarin in, 318.  
 — estimation of fatty acids from, 1037.  
 — fat, nature of, *Proc.*, 5.  
 — influence of food on the composition of, 1023.  
 — making, influence of the concentration of the cream on, 300.  
 — melting point and composition of, as affected by nutrition, 173.

Butterflies, yellow pigment in, *Proc.*, 117.  
 Butters, Italian and mixed, the Reichert-Meissl-Wollny method of analysis as applied to, 448.  
 Butyl cyanide, dibromo-, 686.  
 — ether, dissecondary, 477.  
 — ethers, 366, 477.  
 — sulphide, platinum compounds of, 368.  
 Butylbenzene, tertiary, 127.  
 Butylbenzenes, isomeric changes occurring in the preparation of, with aluminium chloride, 127.  
 — secondary and tertiary, influence of light on the bromination of, 240.  
 Butylbromallylamine, 117.  
 Butyldibromopropylamine, 117.  
 Butyramide, 381.  
 Butyric acids,  $\alpha$ - $\beta$ -dichloro- and  $\alpha$ - $\beta$ -isodichloro-, 236.  
 — tribromide, tertiary bromo-, 689.  
 Butyrene, 235.  
 Butyrylbenzylidenephénylhydrazine, 1160.  
 Butyrylphenol, *Trans.*, 548.  
 Butyrylphenylhydrazine, 1159.  
 Butyrylpropyl cyanide, imido-, 684.

## C.

Cadmium, alloys of, with lead and tin, *Trans.*, 677.  
 — chromite, 1111.  
 — effect of, on the freezing point of sodium, *Trans.*, 673.  
 — electrolytic separation of, from zinc, 1033.  
 — molecular weight of, *Trans.*, 527, 531, 533.  
 — oxide, dissociation of, in the vapour of cadmium, 755.  
 — paradiethylbenzenesulphonate, 493.  
 — silicate, 832.  
 — spectral analysis of, 455.  
 — sulphide, dissociation of, by means of metallic cadmium, 946.  
 — precipitated, modifications of, 946.  
 Caffèine, influence of, on digestion, 534.  
 — oxalate, 1018.  
 — oxidation of, with ozone, 1017.  
 Calamine from Leadhills, *Trans.*, 96.  
 Calcium acetohyponitrite, 945.  
 — arsenates, 827.  
 — barium and strontium, separation of, 77.  
 — caproate, solubility of, 122.  
 — carbonate, solubility of the various forms of, in sea water, 344.

- Calcium chloride, conditions of equilibrium between water and, 752.  
 — tube, substitute for, in elementary analysis, 925.  
 — diethacetate, solubility of, 122.  
 — hyponitrite, 944.  
 — in soils, 542.  
 — magnesium, and aluminium, separation of, 652.  
 — malonate, 691.  
 — molecular weight of, *TRANS.*, 530, 533.  
 — phenylamidoacetate, 1068.  
 — sulphate, hydration of, 466.  
 — — influence of, on the absorption of nitrogen by soils, 1239.  
 — — rates of dissolution of, 466.  
 — — solubility of, 16.  
 — — specific gravity of, 467.  
 — sulphide, phosphorescent, preparation of, 198.  
 — vanado-pyromorphite, *TRANS.*, 94.  
 Caledonite from Leadhills, *TRANS.*, 92.  
 Calorimetric bomb as a combustion furnace for ultimate analysis, 301.  
 Camphene, molecular refraction of, 1069.  
 Camphenols from French essence of terebenthene, 894.  
 Camphols, active and racemic, acetates, and benzoates of, 1002.  
 — heat of combustion of, 328.  
 — normal and acid ethereal salts of, 620.  
 — phthalates of, 621.  
 Camphor, bromo-, isomeride of, 1204.  
 — chloro-, formation of, 1203.  
 — cyano-, action of acids and bases on, 1206.  
 — — action of sodium and ethyl and methyl alcohols on, 1205.  
 — — constitution of, 1205.  
 —  $\alpha$ -nitro-, a nitrophenol isomeric with, 618.  
 — nitro-, derivatives of, 617.  
 — — reduction of, to nitrosocamphor, 720.  
 — nitroso-, 619.  
 — — oxidation by, in presence of light, 1203.  
 — separation of, from borneol, 1002.  
 — series, 721.  
 — specific rotatory and refractive powers of, 453.  
 — specific volume of, 785.  
 Camphoraldehyde, 619.  
 Camphor-derivatives, 1205.  
 Camphoric acids, heat of combustion of, 6.  
 Camphororthoquinone, 619.  
 Camphors, heat of combustion of, 328.  
 Camphors, nitro-, thermochemistry of, 1098.  
 Canary seed, composition of, 794.  
 Caoutchouc, molecular weight of, 1207.  
 Capillary tubes, rise of salt solutions in, 205.  
 Capraldehydesulphonic acid, 121.  
 Caproic acid, normal, solubility of salts of, 122.  
 Caproylcapronitrile, imido-, 684.  
 Capsules, suprarenal, chemical examination of, 290.  
 Carballylic acid, action of bromine on, 588.  
 Carbamide, aldehydic condensation-products of, 1059.  
 — base containing chromium and, 695.  
 — detection of, 1059.  
 — effect of, on the activity of nitric acid, 1109.  
 — the Knop-Hüfner method of estimating, 1039.  
 — See also Urea.  
 Carbaminesulphydrylcinnamic acid, 960.  
 Carbazole and pyrroline, similar reactions of, 260.  
 Carbodiimides, aromatic, and orthodiamines, condensation-products from, 983.  
 Carbohydrate, insoluble, in red clover and lucerne, 643.  
 Carbohydrates, action of, on the animal organs, 1023.  
 — as oxidation-products of vegetable albumin, 1235.  
 — estimation of the digestibility of, 913.  
 — formation of glycogen from, 631.  
 — in normal urine, 293.  
 — insoluble in seeds, 916.  
 — molecular weights of, *TRANS.*, 462.  
 — soluble, in the seeds of leguminosæ, 644.  
 Carbon bisulphide, decomposition of, by shock, *TRANS.*, 220.  
 — — refraction of, 197.  
 — colour test, Eggertz's, influence of sulphur on, 76.  
 — combustion of, in dried oxygen, 465.  
 — effect of high temperature and pressure on, 212.  
 — estimation of, in iron, steel, &c., 308, 1088.  
 — heat of combustion of, 811.  
 — oxysulphide, composition of, 466  
 — — preparation and properties of, 212.  
 — Wiborg's gasometric method for estimating, in iron and steel, 187.

- Carbonates, alkaline, heat of formation of, in very dilute solution, 810.
- Carbon-atoms, polymerisation of compounds containing doubly-bound, 903.
- Carbon-compounds, unsaturated, correspondence between the magnetic rotation and the refraction and dispersion of light by, TRANS., 755.
- Carbonic acid, amides of, 1060.
- — — volumetric estimation of, 651.
- — — anhydride, absorption and condensation of, on clean glass surfaces, 751.
- — — absorption of, by mixtures of alcohol and water, 816.
- — — action of chlorine on, 673.
- — — and sulphurous anhydride, isotherms of a mixture of, 750.
- — — dilatation and compression of, 668.
- — — dissociation of, 205.
- — — elimination of, by means of sodium methoxide, 1126.
- — — estimation of, in the air, 440, 651.
- — — new apparatus for the indirect estimation of, 1032.
- — — percentage of, in the air of soils, 1030.
- — — relation between potential difference and striking distance in, at different pressures, 806.
- — — relation between the intensity of radiation and the decomposition of, by plants, 1234.
- — — solubility of, in chloroform, 1110.
- — — oxide, effect of, on germination, 739.
- — — estimation of, 924.
- — — estimation of, by absorption with cuprous chloride, 187.
- — — estimation of, in air, 1087.
- — — influence of, on germination, 645.
- — — poisoning, new test for the blood in, 88, 650.
- Carbonic-oxide-hæmoglobin, behaviour of, 788.
- Carbopyrotritaric acid, constitution of, 384.
- — — derivatives of, 384.
- Carbostyryl, orthonitro-, 990.
- Carboxyethylorthamidobenzamide, 610.
- Carboxygalactonic acid, 589.
- Carboxyhydrocinnamic acid, para-, and its derivatives, 1181.
- Carboxynaphthyl- $\beta$ -phosphoric acid,  $\alpha$ -, 514.
- Carboxyphenylpicolinecarboxylic acid, 526.
- Carbuvic acid, 593.
- Cartilage, chemical composition of, 736.
- Carvacrolparasulphonic acid, 880.
- Carvole, constitution of, 880.
- Carvoxime, rotatory power of, 1072.
- Cascara sagrada*, constituents of the roots of, 69.
- Casein, decomposition-products of, 1021.
- — — relation of the salts of milk to the behaviour of, 634.
- Casein-dyspeptone, 530.
- Casein-peptone, 530.
- Caseoses, 530.
- Castor oil, density and refractive index of, 86.
- Catalytic action of metals on oxy-hydrogen gas, 206.
- Catechol, action of chlorine on, 599.
- — — diethyl ether, 967.
- — — 3-nitro-, behaviour of with mordants, 868.
- Catecholphthaleïn, 1153.
- Cattle feeding, arsenic in the bone phosphate used for, 548.
- Cell, living, oxidation in, 1028.
- — — reduction of silver nitrate by the, 1028.
- Cell-membrane, vegetable, composition of, 916.
- Cells, living, synthetic action of, 632.
- Cellulose, acetylation of, PROC., 133.
- — — colloidal, 847.
- Cephalis ipecacuanha* volatile base from the root of, 918.
- Cereals, manuring with phosphates, 435, 1242.
- Cerebrospinal fluid, 793.
- Cerium metaphosphate, 756.
- — — quinoline nitrate, 281.
- Cerotic acid from flax fibre, PROC., 155.
- Ceryl alcohol from flax fibre, PROC., 155.
- Chalk, phosphatic, enrichment of, 837.
- Chelidonine, 62.
- Chemical action, action of a magnet on, 9.
- — — between solids, 817.
- — — affinity, selective, 332.
- — — change, gradual, 462.
- — — non-reversible, nitration of benzene as a, 10.
- — — rate of, in the inversion of cane sugar by acids, 1103.
- — — processes, accelerating and retarding influences in, 9.
- — — reactions, dead space in, 335.
- — — influence of temperature on the direction of, 335.
- Chemistry, the foundations of, 10.
- Chiastolite, 25.
- China, "crackle," 18.
- Chinethonic acid, 286.
- Chloral, action of, on glucose, 845.
- — — action of unsymmetrical dialkyl carbamides on, 963.
- — — combination of, with glycol, 689.

- Chloral, detection of, in liquids, 85.  
 Chlorates, liberation of chlorine during the decomposition of, 1105.  
 Chlorides, hydrated metallic, heats of dissolution and formation of, 1043.  
 ———— loss of water by, in a vacuum, 1049.  
 ———— influence of, on the composition of the gastric juice, 1227.  
 ———— metallic, action of, on the photochemical decomposition of chlorine-water, 1093.  
 Chlorine, action of, on carbonic anhydride, 673.  
 ———— apparatus for a constant supply of, 13.  
 ———— arguments for the compound nature of, 13.  
 ———— bromine, iodine, and cyanogen, separation and estimation of, 304.  
 ———— detection of, in organic compounds, 796.  
 ———— estimation of, 302.  
 ———— estimation of, in plant ashes, 73.  
 ———— estimation of, in rain water, *TRANS.*, 545.  
 ———— liberation of, during the decomposition of chlorates, 1105.  
 ———— modification of Bunsen's apparatus for estimating, 1087.  
 ———— preparation of, from bleaching powder, 821.  
 ———— volumetric estimation of, 302.  
 Chlorine-water, action of hydrogen chloride and metallic chlorides on the photochemical decomposition of, 1093.  
 Chloriodohydrin ethyl ether, 31.  
 ———— methyl ether, 31.  
 ———— propyl ethers, 31.  
 Chloroform, detection of, in liquids, 85.  
 ———— preparation of, from acetone, 34.  
 Chloromeric acid, 1050.  
 Chlorophyll, 279.  
 Chloropicrin, magnetic rotatory power of, *TRANS.*, 689.  
 Chocolate, detection of foreign starches in, 192.  
 Cholamide, 286.  
 Cholic acid, action of phosphorus oxychloride on, 171.  
 Choline, presence of, in the seeds of *Vicia sativa*, 1029.  
 Cholomethæmoglobin, 637.  
 Chondroitic acid, 737.  
 Chondro-mucoid, 736.  
 Choroid, black pigment of, 788.  
 Chromates, 1117.  
 ———— and mercuric chloride, compounds of, 1120.  
 Chromatology, animal, 1231.  
 Chromic acid and hydrogen peroxide, interaction of, 350, 468, 571.  
 Chromic antimonate, 1124.  
 ———— chloride, preparation of, 832.  
 Chromite, artificial production of, 354.  
 Chromium, 1117, 1121.  
 ———— atomic heat of, 1121.  
 ———— atomic weight of, *TRANS.*, 213.  
 ———— degree of oxidation of, in fluorescent mixtures, 2.  
 ———— double fluorides, 107.  
 ———— estimation of, by means of hydrogen peroxide, 311, 443.  
 ———— metaphosphate, 757.  
 ———— oxyhaloid-derivatives of, 678.  
 Chrysarobin, physiological action of, 539.  
 Chrysene hydrides, 405.  
 Chrysoindincarbamide, 45.  
 Chydrazaine, 14.  
 Cincholeupone, 282.  
 ———— preparation of, from quinidine, 1073.  
 Cincholeuponic acid, 282.  
 Cinchomeric acid, amido-, 1016.  
 ———— imido-, 1016.  
 ———— anhydride, 1016.  
 Cinchona alkaloids, constitution of, 281, 626, 1073.  
 ———— new compounds of, 908.  
 Cinchonamide, 1017.  
 Cinchonas, analysis of, 802.  
 Cinchonidine, constitution of, 626.  
 ———— oxidation of, 626.  
 ———— quinol sulphate, 908.  
 ———— resorcinol sulphate, 908.  
 Cinchonine, oxidation of, 626.  
 Cinnamic acid, heat of combustion of, 460.  
 ———— in the products of decomposition of crude cocaine, 419.  
 ———— series, alloisomerism in the, 1063.  
 ———— acids, chloro-, 1063.  
 Cinnamide, nitramido-, 990.  
 Cinnamoutrile,  $\beta$ -amido-, 683.  
 Cinnamyl piperidide, 1214.  
 Cinnamylcocaine, 283, 284.  
 Cinnamylegonine, 283.  
 Cinnamylhydantoin dibromide, 705.  
 ———— preparation of, 704.  
 Cinnamylhydantoinamide, 705.  
 Cinnamylidenazine, 393.  
 Cinnamylmetapyrazolone, 704.  
 Cinnamylphenylhydrazine, unsymmetrical, 1161.  
 Cinnamylpseudo-hydantoin, 704.  
 ———— dibromide, 705.  
 Circulation, influence of carbohydrates on, 1023.  
 Cistern deposits, 1111.  
 Citraconic acid, molecular refraction of, 198.  
 Citric acid, *TRANS.*, 235.



- Citric acid and tartaric acid, estimation of, when mixed, 447.  
 ——— in cow's milk, 178.  
 Citrodianilide, 768.  
 Citroparaditoluidide, 768.  
 Citryl monochloride, chloro-, action of aniline on, *TRANS.*, 237.  
 ——— action of heat on, *TRANS.*, 237.  
 ——— action of orthotoluidine on, *TRANS.*, 239.  
 ——— action of water on, *TRANS.*, 236.  
 ——— constitution of, *TRANS.*, 240.  
 Clay, influence of, on the absorption of nitrogen by soils, 1239.  
 Clover, American red, 299.  
 ——— Dutch, analyses of, 1078—1082.  
 ——— perennial red, analyses of, 1078—1082.  
 ——— red, insoluble carbohydrate in, 643.  
 Clovers, nutritive value and produce of, 1077.  
 Cobalt and nickel, 1114.  
 ——— salts, relative absorption of, by animal organs, 538.  
 ——— separation of, 653, 747, 1116.  
 ——— separation of, in the form of nitrites, 188.  
 ——— atomic weight of, 759.  
 ——— dioxide of acidic properties, 1115.  
 ——— estimation of, 678.  
 ——— hydroxide, crystallised, 1114.  
 ——— metallic, solution for depositing, 348.  
 ——— molybdate, 760.  
 ——— orthosilicate, 831.  
 ——— passivity of, 1114.  
 ——— peroxide, 678.  
 ——— presence of another element in, 349.  
 ——— relation of, to iron, as indicated by absorption-spectra, *PROC.*, 14.  
 ——— salts, titration of, with potassium manganate, 798.  
 ——— separation of nickel from, 653, 747.  
 ——— separation of zinc from, 653.  
 ——— ultra-violet spectrum of, 89.  
 ——— volumetric estimation of, in presence of manganese, nickel, &c., 442.  
 Coca-bases, 731, 732.  
 Cocaine acid, 732.  
 Cocaine, 168.  
 ——— a metamerie, and its homologues, 420.  
 ——— alkaloïds occurring with, 628.  
 ——— cinnamic acid in the products of decomposition of crude, 419.  
 Cocaine, commercial preparation and partial synthesis of, 168.  
 ——— methiodide, 170.  
 ——— methochloride, 170.  
 Cocaines, 419.  
 Cocamine, 731.  
 Cocaylbenzoylhydroxyacetic acid, 168.  
 Cocaylhydroxyacetic acid, 169.  
 Cochineal, detection of, in alimentary substances, 324.  
 ——— test for, in wine, 655.  
 Cocoa fat, constituents of, 35.  
 Cocoa-nut oil, adulteration of lard with, 320.  
 Cocylecgonine, 732.  
 Coerylic acid, 732.  
 Cod liver oil, alkaloïds from, 63.  
 ——— an acid from, 170.  
 Codeïne, 625.  
 Colchicine, 282.  
 Colloïds, determination of the molecular weight of, in solution, *PROC.*, 109.  
 ——— molecular weight of, 1207.  
 ——— precipitation of, by salts, 99.  
 ——— solutions of, physical properties of, 98.  
 Colouring matter of wine, testing the, 655.  
 ——— matters, action of micro-organisms on, 67.  
 ——— of fungi, 919.  
 Combustion, imperfect in gaseous explosions, 337.  
 ——— in dried oxygen, 465.  
 ——— of organic substances in oxygen at high pressure, 929.  
 ——— slow, of organic substances, 639.  
 Compressibility of gases at very high pressures, 8.  
 Compression of air, 460.  
 Conductivity, electrical, of concentrated solutions of sulphuric acid, 556.  
 ——— of fused salts, 457.  
 ——— of saline solutions, 808, 809.  
 ——— of solid mercury, 557.  
 ——— of solutions of zinc sulphate containing gelatin, 809.  
 ——— osmotic pressure and reduction of the freezing point, relation between, 668.  
 ——— electrolytic, of rock crystal, 91.  
 ——— heat, of mercury vapour, 559.  
 ——— of mixtures of ethyl alcohol and water, 459.  
 ——— irreciprocal, 3.  
 ——— of electrolytes, apparatus for determining, 4.  
 Coniceïns, 901.  
 Conine, specific rotatory and refractive powers of, 453.

- Connective tissue fibres, action of digestive fluids on, 913.
- Copper acetylacetone, action of, on carbonyl chloride, 235.
- and mercury, electrolytic method of separating, 797.
- antimonate, 1124.
- chloride, electrolysis of, 458.
- — new hydrated, 17.
- dissolution of, in acids, *TRANS.*, 361.
- electrolytic estimation of, 77, 188.
- electrolytic, occlusion of gas by, 105, 946.
- estimation of, by the iodide method, 309.
- iodide, *PROC.*, 2.
- magnesium group, mixed double sulphates of, 346.
- metallic, Hampe's method for estimating cuprous oxide in, 1033.
- oxide, combination of, with starches, sugars, and mannitols, 1133.
- oxybromide analogous to atacamite, 1112.
- periodate, *TRANS.*, 150.
- potassium chloride, reversible transformation of, 819.
- pyrites, artificial, 354.
- — oxidation of the sulphur in, by an electric current, 926.
- reaction of, 747.
- salts, alleged reaction of, 795.
- — interaction of iodides with, *PROC.*, 2.
- slag, red, containing artificial cuprite, 467.
- solutions, alkaline, reduction velocity of, 462.
- sulphate, formation of cuprous chloride and bromide from, 675.
- See also Cuproscopic and Cuprous.
- Coral, solubility of in sea water, 682.
- Cordierite-gneiss from Connecticut, 25.
- Corpuscles, red, the stromata of, 1231.
- Cotarnic acid, 418.
- Cotarnine and its derivatives, constitution of, 418.
- hydriodide, 417.
- Cotarnmethine methiodide, 417.
- Cotarnone, 417.
- Cotton-seed oil, Bechi's newest test for, 86.
- — — density and refractive index of, 86.
- — — detection of, in lard, 194, 319, 320, 659.
- — — detection of, in olive oil, 658.
- Coumaric acid, ortho-nitro-, 507, 989.
- series, ortho-, 989.
- — transition from the, to the quinoline series, 990.
- Coumarin, new source of, 644.
- — ortho-nitro-, 989.
- Coumarinic acid, ortho-nitro-, 989.
- series, ortho-, 989.
- Cows, influence of food on the composition of butter, 1023.
- — milk, feeding of, 1076.
- Cow's-milk, specific gravity of, 915.
- Crayfish, gastric juice of, 534.
- Cream, influence of the concentration of, on butter making, 300.
- Creatinines, 165.
- Creolin, 389.
- Cresol, meta-, bromination of sulphonic acids of, 863.
- — — direct preparation of from toluene, 241.
- — nitrobromortho, 248.
- — ortho-, derivatives of, 128.
- Cresolparasulphonic acid, diiodometa-, 994.
- Cresols, action of iodine on, in alkaline solution, 1150.
- — iodortho-, iodopara- and iodo-meta- and their salts, 698.
- — meta-, derivatives of, 389.
- — nitrometa-, 497.
- Cresolsulphonic acids, derivatives of, 129.
- Cresyl methyl ether, amidoazopara-, 499.
- — — chloro-, 499.
- — — metamidopara-, 499.
- — — para-, amido-derivatives of, 698.
- Crotonic acid, molecular weight of, 1140.
- acids, action of hydriodic acid on, 1057.
- — — and their halogen substitution-derivatives, geometrical constitution of, 236.
- — —  $\alpha\beta$ -bromo- and  $\alpha\beta$ -isobromo-, 236.
- — — chloro-, 488.
- — — geometrical constitution of the, and of their halogen substitution-products, 1057.
- Crotonitrile,  $\beta$ -amido-, 683.
- Crotonylene dibromide, 576.
- hydrobromide, 576.
- — — constitution of, 577.
- — — conversion of, into bromopseudobutylene, 576.
- Cryolite, electrolysis of, 676.
- — estimation of iron and silicon in, 927.
- Cryoscopical investigations, apparatus for, 1043.
- Cryptogams, vascular, occurrence of aluminium in, 182.
- Crystalline form of grape sugar and of optically active substances, 1041.

Crystallisation and physical union, 817.  
 — apparatus for, at a low temperature and in absence of moisture and air, 464.  
 Cumaldehydephenylhydrazone, 251.  
 Cumenyl carbamate, 773.  
 Cumenylpropionic acid, constitution of, 1182.  
 Cumenylthiohydantoin hydrochloride, 774.  
 Cumidine,  $\psi$ -, thio-bases from, 603.  
 Cuminalmalonic acid, 1182.  
 Cumylacetone, 1183.  
 Cumylacetoxime, 1183.  
 Cumylamine, 773.  
 Cumylenediazosulphide, 772.  
 Cumylmalonic acid, 1182.  
 Cupreine, 1018.  
 — salts, solubility and specific rotatory powers of, 1019.  
 Cupric. See Copper.  
 Cuprite, artificial, contained in red copper slag, 467.  
 Cuproscupric cyanide, 359.  
 Cuprous bromide and chloride, formation of, from copper sulphate, 675.  
 — chloride, vapour-density of, 674.  
 — oxide, Hampe's method for estimating, in metallic copper, 1033.  
 Cuttle fish, ptomaine from, 421.  
 Cyanacetophenone and its derivatives, 873.  
 Cyanamide, derivatives of, 951.  
 Cyandiethylpropine, 684.  
 Cyandiphenylethine, 578.  
 Cyanethine and its analogues, constitution of, 577.  
 — and its derivatives, 685.  
 — preparation of, 360.  
 Cyanic acid, additive products of, 393.  
 Cyanides, hydration of, *Proc.*, 122.  
 Cyanite from North Carolina, 24.  
 Cyanmethine, synthesis of, 683.  
 Cyanobenzyl chloride, ortho-, action of, on ethyl sodacetacetate, and on ethyl sodomalonate, 1172.  
 Cyanobenzylamine, 684.  
 Cyanocamphor, action of acids and bases on, 1206.  
 — action of sodium and ethyl and methyl alcohols on, 1205.  
 — constitution of, 1205.  
 — thermochemistry of, 1098.  
 Cyanogen, chlorine, iodine, and bromine, separation and estimation, 304.  
 — compounds, estimation of, in the products of the distillation of coal, 653.  
 — disulphhydrate, 1141.  
 Cyanomalonic acid, ethereal salts of, 858.  
 Cyanoquinoline, ortho-, 905.

Cyanphenin, synthesis of, 951.  
 Cyanurates, 30.  
 Cymene, bromo-, from thymol and from cymene, oxidation of, 495.  
 — chloro-, from cymene and from thymol, oxidation of, 495.  
 — dinitrobromo- and dinitrochloro-, 493.  
 — nitrobromo- and nitrochloro-, 493.  
 Cymyl ethyl ether, iodo-, 697.  
 — iodo-, salts of, 697.  
*Cyperus esculentus*, fatty oil of, 1029.  
 Cyrtolite, so-called, of Ytterby, 220.  
 Cystin, 430.  
 Cystinuria, diamines (ptomaines) in, 1024.

## D.

Dahlia bulbs, asparagine and tyrosine in, 433.  
 Dammar resin, 621.  
*Daucus carota*, essential oil of, 277.  
 Dead space in chemical reactions, 335.  
 Decomposition, double, temperature of transformation in, 930.  
 Decyl- $\beta$ -isopropylacrylic acid,  $\alpha$ -, 741.  
 Dehydracetic acid, 957.  
 Dehydrothioluidine, *TRANS.*, 228, 232.  
 — and its derivatives, 498.  
 — constitution of, 867.  
 Dehydrothioluidinesulphonic acid, *TRANS.*, 231.  
 Density numbers of Groshans, 813.  
 — of salt solutions, 329.  
 Deoxybenzoïn, action of ammonium formate on, 883.  
 — derivatives of, 512.  
 Deoxybenzoïnoxime, intramolecular change of, 1067.  
 Deoxypyranilpyroic acid, bromo-, Reissert's, 258.  
 — dibromide, Reissert's, 258.  
 Deoxytoluoin, 513.  
 Desmotropy in phenols, 247, 966.  
 Deuteroelastose, 423.  
 Deuteromyosinose, 423.  
 Dextrin, saccharification of, by diastase, 581.  
 Dextrins, molecular weights of, *TRANS.*, 469.  
 Dextromenthone, 722.  
 Dextrose, action of phenylhydrazine on, 1130.  
 — constitution of, 1130.  
 — in normal urine, 293.  
 — molecular weight of, 367.  
 Diacetohydrastineoxime, 908.  
 Diacetonediphenoldihydrazine, 263.  
 Diacetosuccinic acid, 386.

- Diacetyl, dibromo-, 491.  
 — homologues of, 1137.  
 — preparation of, 491.  
 — reduction of, 1137.  
 Diacetylbenzylparaphenylenediamine, TRANS., 592.  
 Diacetylbutane, *aw*-, PROC., 143.  
 Diacetylcaproic acid, *aw*-, TRANS., 334.  
 Diacetylcapronamide, *aw*-, TRANS., 342.  
 Diacetyldibromorthotoluidide, 135.  
 Diacetyldicarboxylic acid, 490.  
 Diacetyldinitrotoluquinol, 970.  
 Diacetylenylenediphenyldiamine, 1010.  
 Diacetylhydrazoxime, 47.  
 Diacetylimide, 712.  
 Diacetyl-1 : 4-naphthylenediamine, 893.  
 Diacetylparadimethyldihydroxythiobenzene, 246.  
 Diacetyl- $\beta$ -paranitrophenyldiparamidotolylmethane, 132.  
 Diacetylpentane, *aw*-, TRANS., 330, 335.  
 — action of dehydrating agents on, PROC., 143.  
 — action of reducing agents on, PROC., 145.  
 Diacetylpentanedioxime, *aw*-, TRANS., 337.  
 Diacetylphenanthraquinonedioxime, 1202.  
 Diacetylphenylhydrazine,  $\alpha\beta$ -, 1159.  
 Diacetyltetrahydronaphthylenediamine, 782.  
 Dialkylcarbamides, unsymmetrical, 962.  
 Dialkylphthalides, synthesis of, 257.  
 Diallyl, oxidation of, 226.  
 Diamide. See Hydrazine.  
 Diamine-compounds, metallic, 351.  
 Diamines, action of diketones on, 851.  
 — in cystinuria, 1024.  
 — ortho-, oxidation of, 1154.  
 — para-, oxidation of, PROC., 115.  
 Dianisidine, 511.  
 Diaspore from Wermland, 220.  
 Diastase, artificial, 621.  
 Diazinenaphthoic acid sulphide, 153.  
 Diazines, hydrogenated para-, of the aromatic series, 1010.  
 Diazoamidobenzamide, meta-, 778.  
 Diazoamidobenzene, metanitroparabromo-, ethylation of, TRANS., 429.  
 — — methylation of, TRANS., 427.  
 — parabromo-, and its methyl-derivative, TRANS., 435.  
 — parametadinitro-, and its alkyl-derivatives, TRANS., 415.  
 — paranitroparabromo-, ethylation of, TRANS., 424.  
 — — methylation of, TRANS., 420.  
 Diazoamido-compounds, 774.  
 — — alkyl, synthesis of heterogeneous mixed, TRANS., 610.  
 — — mixed, isomerism of the alkyl-derivatives of, TRANS., 412.  
 Diazoamidodiphenylmethane, 261.  
 Diazoanisolethylamine, disortho- and para-, 775.  
 Diazoanisolemethylamine, disortho- and para-, 774.  
 Diazobenzene salts, action of stannous chloride on, 1156.  
 — sulphate, ortho- and meta-, 975.  
 Diazobenzenebenzamidine, 1005.  
 Diazobenzeneecumylamine, 773.  
 Diazobenzene-ethyl- $\beta$ -tetrahydronaphthylamine, 889.  
 Diazobenzeneimide, action of stannous chloride on, 1157.  
 — paranitro-, 1157.  
 Diazobenzenenitrosodimethylaniline, 702.  
 Diazobenzenesulphonic acid, nitro-, 144.  
 Diazobenzene- $\alpha$ -tetrahydronaphthylamine, 784.  
 Diazo-compounds, decomposition of, 975.  
 — — decomposition of some, by formic and acetic acids, 45.  
 — — of the fatty series, constitution of, 586.  
 Diazo-hydrocarbons, action of stannous chloride on salts of, 1156.  
 Diazoimido-hydrocarbons, some reactions of, 1156.  
 Diazoisobutylbenzene, action of stannous chloride on, 1157.  
 Diazometaxylenesulphonic acid, 611.  
 Diazonaphthalene sulphate,  $\beta$ -, action of stannous chloride on, 1157.  
 Diazonaphthalenesulphonic acid,  $\gamma$ -, 154.  
 Diazonaphthalenesulphonic acid,  $\delta$ -, 155.  
 Diazonaphthalenesulphonic acids, isomeric  $\alpha\alpha$ -, 156.  
 Diazonitrobenzenesulphonic acid, 708.  
 Diazoparaxylenesulphonic acid, 611.  
 Diazosuccinic acid, 376.  
 Diazothiodiethylaniline, 777.  
 Diazothiodimethylaniline, 775.  
 Diazothiole cyanide, dianilido-, 873.  
 — dianilidoortho-, 872.  
 Diazotoluene salts, ortho-, action of stannous chloride on, 1156.  
 Diazotolueneecumylamine, para-, 773.  
 Diazotoluenedimethylamine, para-, 774.  
 Diazotriazobenzenesulphonic acid, 398.  
 Dibarium oxyamidodisulphonate, TRANS., 763.  
 Dibenzamidodihydroxytetrene, 249, 391.  
 Dibenzoylbenzylmetaphenylenediamine, TRANS., 598.  
 Dibenzoylbenzylparaphenylenediamine, TRANS., 592.  
 Dibenzoylcinnamene,  $\alpha\beta$ -, PROC., 136, 139.

- Dibenzoylcinnamenehydrazone, *Proc.*, 141.  
 Dibenzoyldimethyldiamidobenzophenone, 1188.  
 Dibenzoylmethane, nitroso-, 712.  
 Dibenzoylmethyl bromide, 712.  
 Dibenzoylmethylene bromide, 712.  
 Dibenzoylpentane, *aw*-, *TRANS.*, 330, 347, 348.  
 Dibenzoylpentanedioxime, *TRANS.*, 349.  
 Dibenzoylphloroglucinols, isomeric, 1152.  
 Dibenzyl ketone, bromo-derivatives of, 884.  
 Dibenzylamidoinamine, *TRANS.*, 598.  
 Dibenzylbenzoylhydroxylamine, 501.  
 Dibenzylbromobenzeneazammonium chloride, 502.  
 Dibenzylcarbamide, paradinitro-, 982.  
 Dibenzyldiamidophenazine, *TRANS.*, 599.  
 Dibenzylhydrazine, hydrochloride, 393.  
 Dibenzylhydroxylamine,  $\alpha$ -, 704.  
 Dibenzylidenediamidodiphenylamine, *TRANS.*, 594.  
 Dibenzylidenestilbenediamine, 1191, 1192.  
 Dibenzylindamine, *TRANS.*, 593.  
 Dibenzylmethylhydroxypyrimidine, 1008.  
 Dibenzylphenylazonium chloride, 1159.  
 Dibenzylphosphinic acid, 1168.  
 ——— dinitro-, 1168.  
 Dibenzylstilbenediamine, 1192.  
 Dibenzylthiocarbamide, paradinitro-, 982.  
 Dibornylamine, and its derivatives, 1003.  
 Dibromhydrin,  $\alpha$ -, preparation of, 31.  
 Dibutylene dichloride, chloro-, 843.  
 Dicarbonyltriamidobenzene, 46.  
 Dicumenylcarbamide, 774.  
 Dicumenyloxamide, 773.  
 Dicumyl carbamate, 241.  
 Dicyanodiamidine, preparation of, 951.  
 Dicyanophenylhydrazine, compounds derived from, 702.  
 Didymium-group, absorption-spectra of the elements of, *TRANS.*, 259.  
 Diethamido- $\alpha$ -propionic acid, 1139.  
 Diethenyldiamidodiphenol, 262.  
 Diethenyltetramidobenzene, 974.  
 Diethoxyacetone, 235.  
 Diethoxydichloroquinone, *para*-, 707.  
 Diethoxydiphenyl- $\alpha$ - $\gamma$ -diketopiperazine, *para*-, 1012.  
 Diethoxydiphenylpiperazine, *para*-, 1011.  
 Diethoxyquinol, dichloro-, 707.  
 Diethyl allophanyltartrate, 394.  
 ——— carbopyrotartrate, 384.  
 ——— ketone, nitroso-, 585.  
 ——— methronate, 592.  
 ——— methylmethronate, 594.  
 ——— phenylthronate, 595.  
 Diethylacetic acid, solubility of salts of, 122.  
 Diethylamine hydrochloride, magnetic rotatory power of, *TRANS.*, 713.  
 ——— magnetic rotatory power of, *TRANS.*, 691, 729.  
 ——— properties of, 688.  
 Diethylaniline bisulphide, paramido-, 777.  
 Diethylanilinthiosulphonic acid, amido-, 776.  
 Diethylbenzene, meta-, and its derivatives, 38.  
 ——— ortho-, 388.  
 ——— para-, and its derivatives, 493.  
 Diethylbenzenesulphonamide, para-, 493.  
 Diethylbenzenesulphonic acid, derivatives of, 388.  
 Diethylcarbamide, unsymmetrical, 962.  
 Diethylidibenzoyldiamidotriphenylmethane, 606.  
 ——— formation of, 1158.  
 Diethylmethylindamine thiosulphonate, 778.  
 Diethyldiphenolmethane, 1187.  
 Diethylene series of hydrocarbons, 839.  
 Diethylenediamine cobalt chloride, chloro-, 352.  
 Diethylenephentriamine, 1167.  
 Diethylhexadecylamine, 689.  
 Diethylmalonic acid, potassium and sodium salts of, 959.  
 Diethylmethylhydroxypyrimidine, 1007.  
 Diethylmethylsulphine platinumchloride, 115.  
 Diethyl- $\alpha$ -naphthylamine, 151.  
 Diethyl- $\beta$ -naphthylamine, hydrogenation of, 1000.  
 Diethyl- $\alpha$ -naphthylaminocarboxylic acid, 152.  
 Diethylphenol, meta-, 39.  
 ——— para-, 493.  
 Diethylphenylazonium iodide, 1158.  
 Diethylphthalide, 257.  
 Diethylpyrrolone, 728.  
 Diethylsuccinic acids, symmetrical, 377.  
 Diethylsulphonediethylmethane, 1233.  
 Diethylsulphonemethylethylmethane, 1233.  
 Diethylthiophenol, 493.  
 Diffusion experiments, simple, 565.  
 ——— in agar jelly, 817.  
 ——— of acids and bases into one another, 1046.  
 ——— of vapours, influence of temperature on, 461.  
 Digestibility of boiled milk, 1225.  
 ——— of soiling rye, 735.  
 Digestion, amylolytic and proteolytic, influence of certain therapeutic agents on, 533.

Digestion, artificial versus animal, 734.  
 — in hydra, 287.  
 — influence of "saccharin" on, 1022.  
 — of beans in the human alimentary canal, 1226.  
 — of mules, 533.  
 — of elastic fibres and allied structures, 912.  
 — peptic, influence of salts on, 431.  
 — proteolytic, and micro-organisms, 64.  
 Dihydrozonepyruvic acid hydrazide, 36.  
 Dihydroapoharmine, 731.  
 Dihydrodiacetylcollidine, 1073.  
 Dihydroethylstilbazole, 164.  
 Dihydromethylfurfuran, 843.  
 Dihydromethylstilbazole, 162.  
 Dihydronaphthalic acid, 717.  
 Dihydroterephthalic acids, isomeric, 1176.  
 Dihydrotetramethylpyridine, 58.  
 Dihydroxybehenic acid, 375, 1146.  
 Dihydroxybenzamidopyrrolone, 1211.  
 Dihydroxybenzodiphenyldipyrazolone, 879.  
 Dihydroxybenzoylbenzenesulphonic acid, 710.  
 Dihydroxybenzylenephosphinic acid, 141.  
 Dihydroxydichloroquinoline, 61.  
 Dihydroxydimethylheptamethylene, ortho-, PROC., 145.  
 Dihydroxydinitroberberine, 628.  
 Dihydroxydiphenyltrichlorethane, di-nitro-para- and tetra-, 998.  
 Dihydroxyethyl-aniline, 1219.  
 Dihydroxyethyl-methylamine, 1218.  
 Dihydroxyisoamylphosphinic acid, 1135.  
 Dihydroxynaphthalene,  $\beta\alpha$ -, 714.  
 Dihydroxynaphthalenedisulphonic acid, sodium ammonium salt of, 273.  
 Dihydroxynaphthalenes, isomeric,  $\alpha\alpha$ -, 157.  
 Dihydroxy $\alpha$ nanthylphosphinic acid, 1135.  
 Dihydroxypentenecarboxylic acid, dichloro-, 853.  
 — — trichloro-, 853, 856.  
 Dihydroxyphosphinic acids, 1134.  
 Dihydroxy- $\alpha$ -picoline, di- and trichloro-, 856.  
 Dihydroxypyridinecarboxylic acid, nitro-, 519.  
 Dihydroxyquinolinecarboxylic acid, 519.  
 Dihydroxyquinone, nitro-, 968.  
 — symmetrical derivatives of, 968.  
 Dihydroxystearic acid, 123, 690.  
 Dihydroxystilbene, para-, 997.  
 Dihydroxytartaric acid, 1149.  
 Dihydroxyterephthaldihydroxamic acid, 871.

Dihydroxythiobenzenes, 245.  
 Dihydroxytoluquinone, nitro-, 969.  
 Dihydroxytolylcarbamide, 972.  
 Dihydroxytriphenylmethane, para-, and its derivatives, 1188.  
 Dihydroxyundecylic acid, 375.  
 Di-isoamylidiphenyltetrazone, 1159.  
 Di-isoamylphenylamine, 700.  
 Di-isobutyl ether, 477.  
 Di-isobutylamine, magnetic rotatory power of, TRANS., 697, 731.  
 Di-isobutyldiphenyltetrazone, 1159.  
 Di-isobutylphenylamine, 700.  
 Di-isocrotyl and its derivatives, 362.  
 Di-isopropyl carbinol, 477.  
 — ketone, 477.  
 Di-isopropylamine, 953.  
 Di-isopropylammonium nitrite, 955.  
 Di-isopropylcarbamide, unsymmetrical, 963.  
 Di-isopropyldiphenyltetrazone, 1159.  
 Di-isopropyldipyrrolone, 401.  
 Di-isopropylindole, 3 : 3', 401.  
 Di-isopropylmethyldihydroquinoline, 402.  
 Di-isopropylnitrosamine, 954.  
 Di-isopropylsuccinic acid, 373.  
 Diketoamethylcarboxylic acid, mono- and di-chloro- $\alpha\delta$ -, 854.  
 Diketoheptane, secondary,  $\alpha\beta$ -, 1138.  
 Diketoheptane,  $\alpha\beta$ -, 1138.  
 — secondary,  $\alpha\beta$ -, 1138.  
 Diketoexamethylenedioxime, 1147.  
 Diketoexamethylenediphenylhydrazone, 1148.  
 Diketoheptane, hexachloro-, 599.  
 Diketoheptene,  $\alpha\beta$ -, 1139.  
 Diketoheptene,  $\alpha\beta$ -, 1139.  
 Diketoheptene, 1067.  
 Diketoheptenedioxime, 1067.  
 Diketones, action of diamines on, 851.  
 Diketones,  $\alpha$ -, condensation of, with ethyl acetoacetate, PROC., 1888, 114.  
 — mixed, 1170.  
 Diketo-octane, secondary  $\alpha\beta$ -, 1138.  
 Diketopentamethylene, bromo- and chloro-derivatives of, 855.  
 Diketopiperazines,  $\alpha\beta$ -, 1015.  
 Diketopiperazines,  $\alpha\gamma$ -, 1011.  
 Dilatation of air, 460.  
 — of salt solutions, 330, 1101.  
 — — — by heat, 204.  
 Dimethacrylic acid, polymeric, 374.  
 Dimethamidobenzoic acid, nitroso-para-, and its derivatives, 511.  
 Dimethamidobenzophenone, nitroso-, 511.  
 Dimethoxydichloroquinol, 707.  
 Dimethoxydichloroquinone, 707.  
 Dimethoxydihydroxybenzene from apiole, 407.  
 Dimethoxydiphenylpiperazine, para-, 1011.

- Dimethoxyindigo, 1169.  
 Dimethoxyphthalic acid, 167.  
 Dimethoxyquinazoline, 610.  
 Dimethyl carbopyrrotritartrate, 385.  
 Dimethylacetylenediureine, 126.  
 Dimethylacetylpyrrolidine, 57.  
 Dimethylacetylpyrrolinocarboxylic acid, 57.  
 Dimethylallylene, action of hydrogen chloride on, 1127.  
 Dimethylamidobenzhydrol and its derivatives, 263.  
 Dimethylamine, heat of neutralisation of, 811.  
 ——— properties of, 688.  
 Dimethylaniline, action of carbon bisulphide on, in presence of nascent hydrogen, 130.  
 ——— bisulphide, di-imido-, 776.  
 ——— mercaptan, amido-, 775.  
 ——— nitroso-, phenylmethylhydrazone of, 702.  
 Dimethylanilinethiosulphonic acid, amido-, 776.  
 Dimethylbenzaldehyde, 131.  
 Dimethylbenzoïn, dipara-, 513.  
 Dimethylbenzoylenecarbamide,  $\alpha\gamma$ -, 610.  
 Dimethylbenzyl salts, 391.  
 Dimethylbenzylcarbamide, 391.  
 Dimethylbenzylthiocarbamide, 391.  
 Dimethylbromobenzeneazammonium compounds, 502.  
 Dimethylcarbamide, unsymmetrical, 962.  
 Dimethyleinchonic acid, para- $\alpha$ -, 413.  
 Dimethyldehydrothiotoluidine, TRANS-, 230.  
 Dimethyldiamidobenzhydrol, 263.  
 Dimethyldiamidodiphenylamine, 264.  
 Dimethyldiamidoquinoxaline, 604.  
 Dimethyldihydroxydiquinoxaline, 605.  
 Dimethyldiketohydrindene, 1068.  
 Dimethyldiphenolmethane, 1187.  
 Dimethyldiphenylpiazine tetrahydride, [1 : 4 : 2 : 3-], TRANS-, 104.  
 Dimethylenemethane, 30.  
 Dimethylethoxypyrimidine, 1006.  
 Dimethylethylhydroxypyrimidine, 1007.  
 Dimethylglycoluril, 126.  
 Dimethylheptamethylene, ortho-, PROC., 145.  
 ——— dibromo-, PROC., 145.  
 Dimethylhexadecylbenzene, 130.  
 Dimethylhydroxypyrimidine, 1006.  
 Dimethylhydroxysulphonebenzide, 246.  
 ——— para-, 246.  
 Dimethylimidomethylthiazoline, 415.  
 Dimethylindamine thiosulphonate, 778.  
 Dimethylketol, 1137.  
 Dimethylketopentene, 594.  
 Dimethylmalonic acid, specific heat of, 93, 94.  
 Dimethylmalonic acid, thermochemistry of, 1097.  
 Dimethyl- $\alpha$ -naphthindole [2'' : 3''], 259.  
 Dimethyl- $\beta$ -naphthindole [2'' : 3''], 259.  
 Dimethyl- $\alpha$ -naphthylamine and its derivatives, 150.  
 Dimethyl- $\alpha$ -naphthylaminocarboxylic acid, 151.  
 Dimethylnaphthylaminesulphonic acid, 151.  
 Dimethyloxydihydrotoluquinoxaline, 280.  
 Dimethylxydinaphthylenemethane, 1188.  
 Dimethylphenylpyrazole, 57.  
 Dimethylphthalide, 257.  
 Dimethylpyrrocol [2 : 4], 58.  
 Dimethylpyrone, 957.  
 Dimethylpyrrolidine and its derivatives, 977.  
 ——— methiodide, 1016.  
 Dimethylpyrrolidone, 1016.  
 Dimethylpyrrolidine, meta-, derivatives of, 408.  
 ——— unsymmetrical, derivatives of, 57.  
 Dimethylpyrrolinocarboxylic acid, 409.  
 Dimethylpyrrolinedicarboxylic acid-imineanhydride, 58.  
 Dimethylpyrrolines, 1209.  
 ——— in Dippel's oil, 1209.  
 Dimethylpyrrol cinnamyl ketone, 1210.  
 ——— 2, 4-, 1209.  
 Dimethylquinoline [2' : 3'-], 523.  
 Dimethylracemic acid, 491.  
 Dimethylstilbene sulphide, diamido-, 602.  
 Dimethylsuccinic acid, formation of, 959.  
 ——— para-, and its derivatives, 490.  
 ——— acids, action of bromine on, 371.  
 ——— symmetrical, 490.  
 ——— derivatives of, 692.  
 ——— preparation of the isomeric, 122.  
 ——— thermochemistry of, 1097.  
 Dimethylsuccinonitrile, 959.  
 Dimethylsulphonediethylmethane, 1233.  
 Dimethylsulphonedimethylmethane, 1233.  
 Dimethylsulphonemethylethylmethane, 1233.  
 Dimethyl- $\alpha$ -tetrahydronaphthylamine, 892.  
 Dimethyl- $\beta$ -tetrahydronaphthylamine [alicyclic], 891.  
 Dimethyl- $\beta$ -tetrahydronaphthylamine [aromatic], 890.  
 Dimethylthiazole,  $\alpha\mu$ -, 723.

- Dimethyltoluindamine thiosulphonate, 778.
- Dimethyltrichlorobromobenzeneazamonium iodide, 502.
- Di- $\alpha$ -naphthylbenzil, 147.
- Dinaphthylamine,  $\beta$ -, thio-derivatives of, 51.
- Dinaphthylamines, dithio-, 51.
- Dinaphthyl- $\alpha$ - $\gamma$ -diketopiperazine, 1015.
- Dinaphthylparaphenylenediamine,  $\beta$ -, and its derivatives, 894.
- Di- $\alpha$ -naphthylpiperazine, 1011.
- Dioxydiphenylene, perchlor-, 1150.
- Dipentene nitrosochloride,  $\alpha$ -, 1070.
- Dipentenitrolaniline,  $\alpha$ -, 1071.
- Dipentenitrolbenzylamine,  $\alpha$ -, 1071.
- Dipentenitrolpiperidine,  $\alpha$ -, 1071.
- Diphenacyl, 147.
- Diphenacyldihydrazone, 147.
- Diphenamic acid, 145.
- Diphenamide, 145.
- Diphenic anhydride, 145.
- chloride, 145.
- Diphenimide, 145.
- Diphenol, metadiamidopara-, 262.
- para-, derivatives of, 402.
- tetramidopara-, 263.
- Diphenoldihydrazine hydrochloride, 262.
- Diphenols, nitropara-, 262.
- Diphenoltrichlorethane, 997.
- Diphenyl ethyl ether, 510.
- — — dinitro-, 511.
- — — heats of combustion and formation of, 1042.
- Diphenylacetaldehyde, derivatives of, 253.
- Diphenylacetaldehydediphenylhydrazone, 251.
- Diphenylacetic acid, derivatives of, 999.
- chloride, 999.
- Diphenylamidomethylenorthophenylenediamine, 983.
- Diphenylamine arsenious bromide, 211.
- derivatives of, 772.
- orthonitro-, 773.
- Diphenylanilidoacetic acid, 885.
- Diphenyl- $\beta$ -benzoylpropionic acid,  $\alpha$ -, Proc., 138.
- Diphenylbenzoylthiosemicarbazide, 1160.
- Diphenylbenzylthiosemicarbazide, 1159.
- Diphenylboismuthine bromide, 1061.
- Diphenylcarbazide, properties of, 1164.
- Diphenylcinchonic acid,  $\alpha\beta$ -, 413.
- Diphenylcyanotriazole, 702.
- Diphenyl- $\alpha\gamma$ -diethyl- $\beta\delta$ -diketopiperazine, 1013.
- Diphenyl- $\alpha\beta$ -diketopiperazine, 1015.
- Diphenyl- $\alpha\gamma$ -diketopiperazine, 1013.
- homologues of, 1012.
- Diphenyl- $\alpha\delta$ -diketopiperazine, 1014.
- Diphenyl- $\alpha\gamma$ -dimethyl- $\beta\delta$ -diketopiperazine, 1012.
- Diphenyldinitrosacyl, 50.
- Diphenylene, dioxyperchloro-, 1150.
- Diphenyleneketonecarboxylic acid, ortho-, 145.
- Diphenyleneketoxime, 1067.
- Diphenylethylamine, symmetrical, 883.
- Diphenylethylthiosemicarbazide, 1158.
- Diphenylfurfuran,  $\alpha\alpha'$ -, 148.
- Diphenylhydrazohexamethylene, para-, 1148.
- Diphenylhydroxypyrimidine, 1008.
- Diphenylimidomethylthiazoline, 415.
- Diphenylisoamylthiosemicarbazide, 1159.
- Diphenylisobutylthiosemicarbazide, 1159.
- Diphenylisopropylthiosemicarbazide, 1159.
- Diphenylketopiperazine, 1009.
- Diphenyllactic acid,  $\beta$ -, 253.
- anhydride,  $\beta$ -, 253.
- Diphenylmethane, nitro-, 261.
- paramido-, derivatives of, 260.
- Diphenylmethanecarbamide, para-, 261.
- Diphenylmethaneguanidine, tripara-, 261.
- Diphenylmethanehydrazine, 261.
- Diphenylmethanethiocarbamide, dipara-, 261.
- Diphenylmethylpyrazole, trinitro-, 409.
- Diphenylmethyltriazole, 138.
- Diphenyl-5-phenylpyrrolidone, 3-, Proc., 140.
- Diphenyl-5-phenylpyrrolone, 3-, Proc., 140.
- Diphenylpiazine, [2 : 3], TRANS., 99.
- dihydride, TRANS., 98.
- dinitro-, TRANS., 101.
- hexahydride, [2 : 3], and its derivatives, TRANS., 102.
- hexahydride,  $\beta$ - [2, 3], TRANS., 105.
- Diphenylpiperazine and its homologues, preparation of, 1010.
- paradiamido-, formation of colouring matters from, 904.
- preparation of, 904.
- Diphenylpyrazole, [3 : 5], 410.
- Diphenylpyrazoledicarboxylic acid, 409.
- Diphenylpyrazoline [1 : 3], 410.
- Diphenylpyridine, 2, 6-, 1212.
- Diphenylpyridinetricarboxylic acid,  $\alpha\alpha'$ -, 412.
- Diphenylpyrroline,  $\alpha\alpha'$ -, 149.
- Diphenylpyrrolinocarboxylic acid, 149.
- Diphenylquinol, para-, 1171.
- Diphenylquinone, para-, 1171.
- Diphenylquinoxaline, diamido-, 605.
- Diphenylselenazole,  $\alpha\omega$ -, 727.



- Diphenylsulphoneacetone, symmetrical, synthesis of, 1186.  
 Diphenyltetrahydrofurfuran, 148.  
 Diphenyltetrazine, TRANS., 244.  
 — bromo-derivatives of, TRANS., 246.  
 — methiodide, TRANS., 245.  
 Diphenylthiophen [2 : 5], 148.  
 Diphenyltriazenylamidoxime, 978.  
 Diphenyltriazenylbenzenylazoxime, 978.  
 Diphenyltriazenylethenylazoxime, 978.  
 Diphenyltriazole, 703.  
 Diphenyltriazolecarboxylic acid, 703.  
 Diphenyltrichlorethane and its homologues, 713.  
 Diphenyltriketone, 712.  
 Diphosphoric acid, diimido-, 210.  
 — — imido-, 210.  
 Diphosphormonamic acid, diimido-, 210.  
 Diphtalyl-diethylenephényltri-amine, 1166.  
 Dipicolyl, 59.  
 Dipicolylmethane, 161.  
 Dipipecolinemethane, 161.  
 Dipiperidine, 901.  
 Dipiperidyl, 59, 1213.  
 Dipiridyl,  $\alpha$ -, 1212.  
 Dipropylamine arsenious bromide, 211.  
 — magnetic rotatory power of, TRANS., 693. 730.  
 Dipropylaniline, dinitro-, 971.  
 Dipropylanthracene dihydride, 895.  
 Dipropylanthrone, 894.  
 Dipropylcarbamide, unsymmetrical, 963.  
 Dipropylhomophthalic acid and anhydride, 256.  
 Dipropylhomophthalimide, 256.  
 Diquinoline, a base derived from, 416.  
 Diquinolyl of oxyphenylene, diethyl ether of, 729.  
 Diquinolylethylene, 528.  
 Disalicaldehyde, 873.  
 Disdiazobenzene-allylamine, 775.  
 Disdiazobenzene-ethylamine, 774.  
 Disdiazobenzene-methylamine, 774.  
 Disdiazotoluene-allylamine, para-, 775.  
 Disdiazotoluene-methylamine, para-, 774.  
 Dispersion in organic compounds, 805.  
 — magnetic rotation and refraction, correspondence between, in compounds containing nitrogen, TRANS., 750.  
 Disphenylazophenol, 1162.  
 Disphenylhydrazophenyl, 1162.  
 Dissociation, electrolytic, versus hydration, 1099.  
 — of amine vapours, TRANS., 656.  
 — of carbonic anhydride, 205.  
 — of electrolytes, 931.  
 — — heat of, 1044.  
 — — influence of temperature on the, 1044.  
 — — theory of, 202.  
 Dissociation of oxyhæmoglobin, influence of temperature on the tension of, 630.  
 — of saline hydrates and analogous compounds, 815.  
 — of the oxides of zinc and cadmium in the vapours of the respective metals, 755.  
 — of the sulphides of cadmium and zinc by means of metallic cadmium and zinc, 946.  
 Dissolution of metals in acids, method of investigating, TRANS., 361.  
 Distillation, fractional, in a vacuum, apparatus for 12, 206, TRANS., 359.  
 Disulphosalicylic acid, 1062.  
 Di-tetrahydro- $\beta$ -naphthabenzylcarbamide, 1198.  
 Ditetrahydro- $\beta$ -naphthabenzylthiocarbamide, 1198.  
 Ditetrahydronaphthylcarbamide, diamido-, 783.  
 Ditetrahydronaphthylidithiocarbamide, 783.  
 Dithiocyanic acids, 229.  
 Dithioxamide, 1142.  
 Dithymolphenylmethane, 1188.  
 Ditolane hexachloride, 262.  
 Ditolilbenzil, para-, 147.  
 Ditolylene bisulphide, 772.  
 Ditolyl bisulphide, diamido-, 771.  
 — quinone and quinol of, 996.  
 Ditolylamidomethylenorthophenylenediamine, para-, 983.  
 Ditolyl- $\alpha$ - $\beta$ -diketopiperazine, ortho-, 1015.  
 Ditolyl- $\alpha$ - $\gamma$ -diketopiperazine, 1011.  
 Ditolyldiquinone, 997.  
 Ditolyketopiperazine, para-, 1010.  
 Ditolyipiperazines, ortho- and para-, 1011.  
 Ditolytetrazine, para-, TRANS., 247.  
 Dixylcarbamide, 241.  
 Dixyldichlorethylene, 713.  
 — meta-, 713.  
 Dixylene bisulphide, 772.  
 Dixyls, diamido-, and colouring matters derived therefrom, 135.  
 Dixyltrichlorethane, meta-, 713.  
 — para-, 713.  
 Dolerite of Londorf, 110.  
 Dolomite from Leadhills, TRANS., 96.  
 Dolomites from the Central Ural, 837.  
 Dulcitol, combination of with copper oxide, 1133.  
 Dumortierite from Harlem, New York, and Clip, Arizona, 681.  
 Durene, heats of combustion and formation of, 1042.  
 — preparation of, 966.  
 Durenecarboxylic acid, 877.  
 Duroylbenzoic acid, ortho-, 242.

Duryl methyl ketone, consecutive, 50.  
 Dvi-tellurium, theoretical properties of,  
 TRANS., 649.  
 Dyeing, theory of, 49, 869.  
 Dyes fixed in tissues, resistance to light  
 of, 12.  
 — from diamidoethoxydiphenylsulpho-  
 nic acid, 258.  
 — from  $\alpha$ -pyrocresole, TRANS., 54.

# E.

Earth-nut oil, oxidation of the unsatu-  
 rated fatty acids of, 1058.  
 Earths, rare, recent spectroscopic re-  
 searches on, TRANS., 255.  
 Ecgonine, constitution of, 908.  
 — hydrochloride, methyl salt of,  
 action of acid chlorides on, 283.  
 — — specific rotatory power of,  
 1018.  
 Eclogite, from Frankenstein, in Silesia,  
 681.  
 Edisonite, 354.  
 Egg, proteids of white of, 1075.  
 Elaidic acid, boiling points of, 691.  
 Elastic fibres, action of digestive fluids  
 on, 912.  
 Elastin, 423.  
 Elastoses, 423.  
 Electrical behaviour of platinum in per-  
 sulphuric acid, 1041.  
 — conductivity of concentrated solu-  
 tions of sulphuric acid, 556.  
 — — of saline solutions, 808, 809.  
 — — of solutions of zinc sulphate  
 containing gelatin, 809.  
 — — osmotic pressure and reduc-  
 tion of the freezing point, relation  
 between, 668.  
 — — quantitative estimations by  
 measurement of, 545.  
 — relations, certain generic, of the  
 alloys of platinum, 201.  
 — resistance, influence of the state of  
 aggregation of various substances on  
 their, 201.  
 — — of bismuth, 807.  
 — — of mercury, 201, 202.  
 — transport of dissolved salts, 665.  
 Electricity, voltaic, development of by  
 atmospheric oxidation, 90.  
 Electrification, influence of, on the ab-  
 sorption of nitrogen by vegetable soils,  
 1237.  
 Electrochemical effects of magnetising  
 iron, 92.  
 — investigations, new apparatus for,  
 1094.  
 — measurement of currents, 557.  
 — studies, 202.

Electrodes, dropping, 807.  
 Electrolysis, 558.  
 — initial phase of, 663.  
 — of concentrated solutions of sulph-  
 uric acid, 556.  
 — of copper chloride, 458.  
 — of cryolite, 676.  
 — of distilled water, 1094.  
 — of solutions of hydrogen fluoride  
 and potassium antimonate with carb-  
 on electrodes, 559.  
 — — of organic potassium salts and  
 of molten potassium acetate, 1056.  
 — quantitative analysis by, 76.  
 Electrolytes, conductivities of, 202.  
 — conductivity of, apparatus for de-  
 termining, 4.  
 — dissociation of, 931.  
 — free ions in, 558.  
 — heat of dissociation of, 1044.  
 — influence of temperature on the  
 dissociation of, 1044.  
 — influence of the chemical energy of,  
 on the minimum point and change of  
 potential of a voltaic couple, 200.  
 — loss of voltaic energy of, by chem-  
 ical union, 810.  
 — theory of the dissociation of, 202.  
 — voltaic energy of, 665.  
 Electrolytic behaviour of mica at high  
 temperatures, 664.  
 — conductivity of rock crystal, 91.  
 — dissociation versus hydration, 1093.  
 — estimation of metals, apparatus for,  
 548.  
 — method of liquefying gases, 7.  
 — polarisation by metals, 663.  
 Electromotive activity of the ions, 1095.  
 — force of a voltaic couple, effect of  
 chlorine on, 90.  
 — — of amalgams, 2.  
 — — of selenium, 3, 202, 555.  
 — — of thin layers of hydrated  
 peroxides, 661.  
 — forces, abnormal, 457.  
 Element, new, in nickel and cobalt,  
 349, 1114.  
 Elementary analysis, 1248.  
 — substances, announced from 1877 to  
 1887, 13.  
 Elements, atomic weights of, 1104.  
 — chemical, periodic law of the,  
 TRANS., 634.  
 Elemi oil, 1072.  
 Embelic acid, 408.  
 Emodin, 69.  
 Emulsin, action of, on amygdalin, salicin,  
 and carbamide, 566.  
 Enamel, oriental, on tiles and its imita-  
 tion, 1112.  
 Ensilage, decomposition of organic am-  
 moniacal compounds in, 1030.

- Ephedra vulgaris*, alkaloïds from, 1022.  
 Epichlorhydrin, 31, 232.  
 Epidote, absorption-spectra of, 553.  
 Equilibrium, conditions of, between solid and liquid compounds of water with salts, 752.  
 Erbium-group, absorption-spectra of the elements of, *TRANS.*, 265.  
 Ergosterin, 407.  
 Ericaceæ, andromedotoxin in, 644.  
 Erucic acid, boiling points of, 691.  
 ——— conversion of, into behenic acid, 1140.  
 ——— oxidation of, 375, 1146.  
*Erythema nodosum*, chemical composition of the bacillus from, 539.  
 Erythroglicic acid from glycerose, 478.  
 Erythrol, heat of combustion of, 668.  
*Erythroxylon cora*, grown in India, 297.  
*Escholtzia californica*, morphine in, 644.  
 Ethane, dibromonitro-, action of zinc ethyl on, 1128.  
 ——— nitro-, action of alkyl iodides on the sodium-derivative of, 365.  
 ——— action of zinc ethyl on, 112.  
 ——— constitution of, 112.  
 ——— decomposition of, with alkalis, *PROC.*, 1888, 117.  
 ——— magnetic rotatory power of, *TRANS.*, 687.  
 Ethenylamidocumyl mercaptan, 772.  
 Ethenylamidodimethylaniline mercaptan, 775.  
 Ethenylamido-xylyl mercaptan, 772.  
 Ethenylorthoethylphenylenediamine, 600.  
 Ethereal oils, colour reactions of, 802.  
 ——— salts, fatty  $\alpha$ -brominated or  $\alpha$ -chlorinated, action of potassium cyanide on, 377.  
 ——— solutions, separation of, from aqueous liquids, 1086.  
 Ethoxiazobenzenesulphonic acid, 258.  
 Ethoxycinnamylhydantoin bromide, 706.  
 Ethoxydichlorhydroxyquinoline, 61.  
 Ethoxydinitrodiphenylamine, 773.  
 Ethoxydiphenylsulphonic acid, diamido-, 258.  
 Ethoxyethylamine, 1065.  
 Ethoxyethylbenzamide, 1065.  
 Ethoxy- $\gamma$ -hydroxyquinoline,  $\alpha$ -, 519.  
 Ethoxylutidine, 520.  
 Ethoxymethylaniline, para-, 1012.  
 Ethoxyphenylglycine, para-, 1011.  
 Ethoxyphenylimidodiacetic acid, para-, ethoxyanilide, of, 1012.  
 Ethoxy- $\alpha$ -pyridonedicarboxylic acid, 861.  
 Ethyl acetoacetate and pyruvic acid, condensation of, 593.  
 ——— and quinone, condensation-product of, 42.  
 Ethyl acetoacetate and succinic acid, condensation of, 592.  
 ——— chlorinated, action of thiocyanates and thiocarbamide on, 725.  
 ——— chlorination of, 1056.  
 ——— chlorine-derivatives of, 122.  
 ——— condensations of  $\alpha$ -diketones with, *PROC.*, 1888, 114.  
 ——— acetyocyanacetate, derivatives of, 1141.  
 ——— acetosodacetate. See Ethyl sod-acetoacetate.  
 ——— acetylacetonedicarboxylate, 377.  
 ——— acetyladipeate, *PROC.*, 142.  
 ——— acetylbenzilate, 999.  
 ——— alcohol, heat conductivity of mixtures of, with water, 459.  
 ——— influence of, on metabolism in man, 238.  
 ——— nitro-, 366.  
 ——— allophanylglycollate, 394, 964.  
 ——— allophanyl- $\alpha$ -lactate, 394, 964.  
 ——— allophanyltartrate, 965.  
 ——— amidomethylthiazolecarboxylate, 725.  
 ——— amidopropionate, 376.  
 ——— amidovalerate hydrochloride, 961.  
 ——— amyl ketone, 227.  
 ———  $\alpha$ -anilidobutyrate, 1013.  
 ———  $\alpha$ -anilidopropionate, 1012.  
 ——— anilidosuccinate, 1064.  
 ——— anisate, melting point of, *TRANS.*, 551.  
 ——— antidimethylsuccinate, 490.  
 ———  $\alpha$ -aspartate, 382.  
 ———  $\beta$ -aspartate, 381.  
 ——— aspartates, constitution of, 383.  
 ——— azoxypropionate, 376.  
 ——— benzilate, 885.  
 ——— benzophenylhydrazinepyruvate, *TRANS.*, 616.  
 ——— benzoylacetate and succinic acid, condensation of, 594.  
 ———  $\beta$ -benzoyl- $\alpha$ -ethylisosuccinate, 257.  
 ——— benzylcyanosuccinate, 708.  
 ——— benzylbutenyltricarboxylate, 959.  
 ———  $\alpha$ -bromacetate, action of potassium cyanide on, 377.  
 ——— bromodinitrophenylacetoacetate, 781.  
 ——— bromodinitrophenylmalonate, 880.  
 ——— bromofumarate, action of potassium ethoxide on, 376.  
 ——— bromisovalerate, action of silver on, 372.  
 ——— bromomaleate, action of potassium ethoxide on, 376.  
 ———  $\alpha$ -bromopropionate, action of potassium cyanide on, 122.  
 ——— bromopropionate, action of silver on, 371.  
 ——— chloracetoacetates, 588.

**Ethylchloronaphthalenesulphonate**, 155.  
 — cinchonate, 1017.  
 — cinnamate, polymerisation of, 1196.  
 — cinnamyl diacetate, *TRANS.*, 38.  
 — cocaylbenzoylhydroxyacetate, 420.  
 — cumylacetoacetate, 1183.  
 — cumylmalonate, 1182.  
 — cyanide, polymeride of, 114.  
 — products of the polymerisation of, 841.  
 — cyanobenzylacetoacetate (*ortho*-), 1172.  
 — cyanomalonate, 858.  
 —  $\alpha$ -cyanopropionate, 122.  
 — cyanosuccinate, 377.  
 — synthesis by means of, 588.  
 — diacetosuccinate, derivatives of, 385.  
 — hydrolysis of, 385.  
 —  $\alpha\alpha'$ -diacetyladiate, *PROC.*, 141.  
 —  $\alpha\omega$ -diacetylcaproate, *TRANS.*, 333.  
 — action of alcoholic ammonia on, *TRANS.*, 339.  
 — diallylmalonate, 124.  
 — diazoacetate, constitution of, 586.  
 —  $\alpha\omega$ -dibenzoylcaproate, *TRANS.*, 347.  
 —  $\alpha\beta$ -dibromobutyrate, 686.  
 — dibromhydrocinnamate, melting point of, 878.  
 — dibromoketipate, 491.  
 — dibromosuccinate, action of potassium ethoxide on, 376.  
 — dichloracetate, action of, on barium thiocyanate, 727.  
 — dicyanobenzylacetoacetate, (*ortho*-), 1172.  
 — dicyanobenzylmalonate (*ortho*-), 1172.  
 — diethyleyanosuccinate, 377.  
 — dihydroxypropionate, 376.  
 — dihydroxyquinonedicarboxylate and its hydro-derivatives, 878.  
 — diimidodiacetyladiate, *PROC.*, 141.  
 — diketohexamethylenetetra-carboxylate, *para*-, derivatives of, 509.  
 — dimethylacetylpyrrolinecarboxylate, 57.  
 — dimethylthiazolecarboxylate, 724.  
 — dinitrometamethylphenylacetate, 255.  
 — diphenylanilidoacetate, 885.  
 — diphenylchloracetate, 999.  
 — diphenylcyanoacetate, 999.  
 —  $\alpha\alpha$ -diphenylfurfuran- $\beta$ -carboxylate, 148.  
 — diphenylhydrazinediacetyladiate, *PROC.*, 141.  
 —  $\beta$ -diphenylimidolactate, 253.  
 —  $\beta$ -diphenyllactate, 253.  
 — diphenylmethanecarbamate, 261.  
 — diphenylpyrroline- $\beta$ -carboxylate, 148.

**Ethyl ether**, products of the slow combustion of, 579.  
 — ethoxycaprylate, 372.  
 —  $\alpha$ -ethoxy- $\gamma$ -hydroxy- $\beta$ -quinoline-carboxylate, 519.  
 — ethoxy- $\alpha$ -pyronedicarboxylate, 860.  
 —  $\beta$ -ethoxyquartenylate, 488.  
 — ethylacetocyanacetate, 1141.  
 — ethyleyanosuccinate, 577.  
 — ethylenediamidoformate and its nitro-derivatives, 125.  
 — ethylethenyltricarboxylate, 588.  
 — fluoride, 363.  
 — hippurate, action of sodium ethoxide on, 1210.  
 — hydrogen carbutate, 593.  
 — methronate, 592.  
 —  $\gamma$ -truxillate, 1194.  
 — hydrotridecylutidinedicarboxylate, 1017.  
 — hydroxyphenylacetate (*para*-), 1173.  
 — isobutyrate, action of sodium on, 372.  
 — isocarbopyrotitartrate, 385.  
 — isocyanurate, vapour density of, at different temperatures, 1128.  
 — isopropenyl ether, 360.  
 — malonate, action of allyl iodide and zinc on, 124.  
 — action of ethyl iodide and zinc on, 958.  
 — methanetetra-carboxylate, 377.  
 — methenyltricarboxylate, 377.  
 — methylbutenyltricarboxylate, 959.  
 — methylcyanoacetate, 1142.  
 — methyleyanosuccinate, 588.  
 — methyldehydrohexonecarboxylate, preparation of, *TRANS.*, 331.  
 —  $\alpha$ -methyl- $\alpha\omega$ -diacetylcaproate, *TRANS.*, 345.  
 — methyl dihydropentenedicarboxylate, *PROC.*, 142.  
 — methyl dihydropentenemethylketonecarboxylate, *PROC.*, 142.  
 — nitrate, magnetic rotatory power of, *TRANS.*, 682.  
 — nitrobenzoylmalonate, *ortho*-, quinoline-derivatives from, 519.  
 — nitrobenzylcarbamate (*para*-), 982.  
 — nitromalonate, 1143.  
 —  $\alpha$ -nitrosobutyrate, 1140.  
 — oxalosuccinate, 767.  
 — oximidosuccinate, 383.  
 — pentachloroacetate, 123.  
 — perthiocyanate, 228.  
 — phenacylbenzoylacetate, derivatives of, 147.  
 — phenacyl ethylmalonate, 257.  
 — phenanthroxylene-acetoacetate, reactions of, *PROC.*, 1888, 114.

- Ethyl phenylamidocrotonate, action of methyl iodide on, 508.  
 — phenylecyanopyruvate, 990.  
 — phenylhydrazineacetylacrylate, 49.  
 — phenylimidodiacetate anilide, 1014.  
 — phthalate, action of ethyl propionate on, 1068.  
 — propionate, action of, on ethyl phthalate, 1068.  
 — propylecanosuccinate, 588.  
 — pseudocumylcarbamate, 241.  
 — quinonediiimidotetracarboxylate, 509.  
 — quinonedioximecarboxylate, 872.  
 — salicyl aldehyde, melting point of, *TRANS.*, 551.  
 — selenocyanacetate, 726.  
 — sodacetate, action of ethyl chlorocarbonate on, 375, 377.  
 — — action of orthocyanobenzyl chloride on, 1172.  
 — sodium carbamate, action of iodine on, 363.  
 — sodomalonate, action of ethyl chlorocarbonate on, 375, 377.  
 — — action of orthocyanobenzyl chloride on, 1172.  
 — sodophenylsulphoneacetate, action of heat on, 994.  
 — — behaviour of alkyl-halogen compounds with, 994.  
 — sodoquinolotetracarboxylate, 509.  
 — succinosuccinate, action of phosphoric chloride on, 1179.  
 — sulphaminebenzoate (ortho-), 992.  
 — sulphide, platinum-derivatives of, 230.  
 — tartrate, action of potassium ethoxide on, 376.  
 — tetrabromoketipate, 491.  
 — tetrachloracetate, 123.  
 — tetraphenylsuccinate, 999.  
 —  $\beta$ -thiophenyllevulinate, 489.  
 — triazoacetate, 370.  
 — tridecyltutidinedicarboxylate, 1017.  
 — vinyl carbinol, oxidation of, 231.  
 Ethylamine arsenious bromide, 211.  
 — brom-, 1134.  
 — — and its derivatives, 848.  
 — hydrochloride, magnetic rotatory power of, *TRANS.*, 713.  
 — — magnetic rotatory power of, *TRANS.*, 690, 729.  
 — properties of, 688.  
 Ethylaniline, dinitro-, 600.  
 — orthamido, 600.  
 — orthonitro-, and its derivatives, 600.  
 Ethylasparagine,  $\beta$ -, 591.  
 Ethylbenzaldioximes,  $\alpha$ - and  $\beta$ -, 607.  
 Ethylbenzamide,  $\beta$ -brom-, 1134.  
 Ethylbenzene, dispersive power of, 805.  
 Ethylbenzhydroxamic acids, 1064.  
 Ethylbenzoic acid, meta-, 39.  
 Ethylbenzyl cyanide, 597.  
 Ethylbenzylaniline, 606.  
 Ethylbenzylthiocarbamide, *TRANS.*, 300.  
 Ethyl- $\beta$ -chlorotetracrylic acid,  $\alpha$ -, 488.  
 Ethylcinnamaldehyde, metanitro- $\alpha$ -, 984.  
 Ethylcinnamylhydantoin, 705.  
 Ethyl- $\alpha$ -cyanethyl ketone, 842.  
 Ethyldimethylhydroxypyrimidine, 1007.  
 Ethyldimethylindole [ $1' : 2' : 3'$ ], 259.  
 Ethyldiphenyl tricyanide, 697.  
 Ethylene bases, 1166.  
 — cyanide, preparation of, 227.  
 — nitrate, magnetic rotatory power of, *TRANS.*, 684, 726.  
 — solidifying point of, 821.  
 Ethylene- $\psi$ -carbamide, 849.  
 Ethylenediamine, action of, on acetylacetone, 851.  
 — action of, on succinic acid, *TRANS.*, 10.  
 Ethylenediamineluteocobalt chloride, 352.  
 Ethylenedinitrocarbamide, 126.  
 Ethylenedinitrurine, 126.  
 Ethylenedisuccinamic acid, *TRANS.*, 12.  
 Ethylenedisuccinimide, *TRANS.*, 11.  
 Ethylene- $\psi$ -methylthiocarbamide, 848.  
 Ethylenephenylenediamine, 1166.  
 Ethylenephenyldiazine,  $\alpha$ -, 138.  
 Ethylenequinoline, 528.  
 Ethylenequinolinequinaldine, 528.  
 Ethylene- $\psi$ -thiocarbamide, 848.  
 Ethylfumaric acid, 591.  
 Ethylfumarimide, 590.  
 Ethylhexadecylamine, 689.  
 Ethylhexadecylammonium iodide, 689.  
 Ethylenedimethoxyphenyl, 862.  
 Ethylenedimethoxyphenyl, 862.  
 Ethylenedimethylsulphone, 1232.  
 Ethylindene, amido-, 984.  
 Ethylisobutylhydantoin, 706.  
 Ethylmalonic acid, thermochemistry of, 1097.  
 Ethylmetanitriline, action of diazotised parabromaniline on, *TRANS.*, 428.  
 Ethylmethylamine, 1018.  
 Ethylmethylthiethylsulphine platinochloride, 115.  
 Ethylmethylhydroxypyrimidine, 1007.  
 Ethylmethylpyrimidine, 1007.  
 Ethylmethylsuccinic acid, symmetrical, 959.  
 Ethylnitramine, 492.  
 Ethylorthamidophenol, chlor-, 1220.  
 Ethylorthotolylpyrazolammonium iodide, 1217.

Ethylloxalylacetylbenzamidine, 1009.  
 Ethylparabromaniline, action of diazotised metanitraniline on, TRANS., 428.  
 — action of diazotised paranitraniline on, TRANS., 423.  
 Ethylparanitraniline, action of diazotised parabromaniline on, TRANS., 423.  
 Ethylparatolylpyrazolammonium iodide, 1216.  
 Ethylphenylacetic acid, 597.  
 Ethylphenylhydroxypyrimidine, 1007.  
 Ethylphenylsemithiocarbazide, TRANS., 302.  
 Ethylphthalimide, 141.  
 — brom-, preparation of, 870.  
 Ethylphthalimidine, 141.  
 Ethylpiperidylthiocarbamide, TRANS., 624.  
 Ethylpyrimidine, dichloronitro-, 1007.  
 Ethyl- $\alpha$ -stilbazole,  $\beta$ -, and its derivatives, 163, 901.  
 Ethylsuccinic acid, thermochemistry of, 109.  
 Ethyl- $\alpha$ -tetrahydronaphthylamine, 891.  
 — hydrochloride, paranitroso-, 892.  
 Ethyl- $\beta$ -tetrahydronaphthylamine [alicyclic], 888.  
 — [aromatic], 890.  
 Ethyltetraphenylpyrroline, 623.  
 Ethyltriphenylpyrrolinecarboxylate, 149.  
 Ethylurethane, influence of, on digestion, 533.  
 Eucalyptus oil, spontaneous oxidation of 616.  
 Eudidymite, 219.  
 Eudiometer, new form of, 301.  
 Euxanthone, synthesis and constitution of, 886.  
 Evaporation, influence of temperature on, 461.  
 — rapid method of, in analysis, 1246.  
 Exalgine, 704.  
 Expansion by heat of salt solutions, 329.  
 Explosions, gaseous, imperfect combustion in, 337.

**F.**

Faraday lecture, TRANS., 634.  
 Fassait, a new pseudomorph of, 23.  
 Fat, beef, in lard, 659.  
 — butter-, nature of, PROC., 5.  
 — estimation of, in linseed-cake, 1250.  
 — estimation of, in milk, 1037.  
 — formation of, in the organism, 175.

Fat, horse, 1076.  
 — Sawarri, PROC., 69.  
 — volumetric estimation of, in milk, 1250.  
 Fats, decomposition of, by heating under pressure, 586.  
 — solid animal and vegetable, composition of, 1057.  
 — specific gravities of, 801.  
 — vegetable, 295.  
 Fehling's solution, modification in the use of, 1036.  
 Ferment, fibrin-, nature of, 63.  
 Fermentation, alcoholic, formation of glycerol in, 579, 1027.  
 — of milk, 916.  
 — of the juice of the sugarcane, 915.  
 — of galactose, arabinose, sorbose, and other sugars, 480.  
 Fermentations, acetous and lactic, influence of artificial gastric juice on, 1227.  
 Ferments, action of, 566.  
 — fate of certain, in the organism, 178.  
 — unorganised, 515.  
 Ferric chloride, absorption-spectrum of, PROC., 14.  
 — action of, on lead sulphide, 947.  
 — and potassium iodide, reaction between, 1113.  
 — compounds of, with nitric oxide and nitric peroxide, 834.  
 — metaphosphate, 757.  
 — orthotitanate, 948.  
 — potassium thiocyanates, 1129.  
 — sulphate, reduction of in volumetric analysis, 1248.  
 Ferrieyanides, 950.  
 Ferrous hydroxide, crystallised, 1115.  
 — sulphate, action of, on various soils, 436.  
 Fescue, various leaved, analyses of, 1078—1082.  
*Festuca heterophylla*, analyses of, 1078—1082.  
 Fevers, infectious, relation of ptomaines to, 1026.  
 Fibrin, action of saline solutions on, 787.  
 — products of the action of superheated steam on, 910.  
 Fibrin-ferment, nature of, 63.  
 Fichtelite, 614, 714.  
 Field experiments at Grignon in 1888, 541.  
 Field newly laid down to permanent grass, history of a, 920.  
 Filicic acid, 54, 276.  
 — constitution of, 615.

Filicic acid, derivatives of, 54.  
 Fiorin, analyses of, 1078-1082.  
 Fire, coal, blue flame produced by sodium chloride in a, 336.  
 Fish guano, manuring with, 647.  
 Flame, blue, produced by sodium chloride in a coal fire, 336.  
 Flashing point of mineral oils, causes influencing, 82.  
 Flask for distilling frothing liquids in a vacuum, TRANS., 359.  
 Flax, constituents of, PROC., 155.  
 — fibre, chemistry of, 742.  
 Fluocerite from Österby, 765.  
 Fluorammmonium-molybdcic anhydride, 106.  
 Fluorene perhydride, 720.  
 Fluorencarboxylic acid, ortho-, 145.  
 Fluorescein, 246.  
 Fluorescence, change of, with concentration, 553.  
 — evidence afforded by, of the decomposition of molecular-groups in solutions, 554.  
 Fluorescent mixtures, chromium and manganese in, 2.  
 Fluorine and hydrogen, heat of combination of, 1096.  
 — compounds of vanadium, and its analogues, 1123.  
 — estimation of, in substances decomposable by sulphuric acid and especially in natural phosphates, 74.  
 Fœtal tissues, amount of iron in, 789.  
 Food, influence of, on the composition of butter, 1023.  
 — of larval bees, 1022.  
 Foods, composition and digestibility of some, 913.  
 — &c., detection of cochineal in, 324.  
 — estimation of manganese in, 188.  
 Forage crops, growth of, at Grignon in 1888, 542.  
 Formaldehyde and ammonia, formation of nitrous and nitric acids from, in the saliva, 1228.  
 — estimation of, 1036, 1250.  
 — estimation of, by titrating with ammonia, 1250.  
 — formation of acrose from, 483.  
 — formation of saccharoses from, 581.  
 — rôle of, in the assimilation of plants, 640.  
 — synthetical formation of, 766.  
 Formamidoparatoluic acid, ortho-, 1066.  
 Formic acid, concentrated, preparation of, 955.  
 Formonitrile, heats of combustion and formation of, 812.  
 Formose, 584.  
 Formylphenylhydrazine, TRANS., 242, 248.

Francein from 1 : 3 : 4 : 5-tetrachlorobenzene, 970.  
 Frangulin, 69.  
 Freezing point, apparatus for determining the reduction of, 336.  
 — — determination of the latent heat of fusion from the reduction of the, 666.  
 — — molecular lowering of the, of benzene and phenols, 101.  
 — — of sodium, lowering of, by the addition of other metals, TRANS., 666.  
 — — reduction of, osmotic pressure and electrical conductivity, relation between, 668.  
 — points of solutions, law of, PROC., 149.  
 — — — mechanical, chemical, and physical lowering of, PROC., 150, 151.  
 — — of sulphuric acid solutions, PROC., 106.  
 — Raoult's law of, 565, 566.  
*Frittilaria imperialis*, 284.  
 Fruit and beet syrups, discrimination of, 1089.  
 Fruits from the Southern States, 434.  
 Fumaric acid and maleic acid, isomerism of, 124.  
 — — conversion of into maleic acid, 1146.  
 — — ethereal salts of, 237.  
 — — molecular refraction of, 198.  
 — — thermochemistry of, 1097.  
 Fungi, colouring matters of, 919.  
 — saccharine substances in, 740.  
 Furfuraldehyde, metabolism of, in fowls, 289.  
 — preparation of, from jute fibre, TRANS., 209.  
 — reactions, 449.  
 Furfuran- $\beta$ -sulphonic acid,  $\alpha\alpha$ -dibromo-, 386.  
 Furfurine, reduction of, 1192.  
 Fusel oil, estimation of, in spirits, 190, 654.  
 Fusion, latent heat of, determination of from the reduction of the freezing point, 666.

## G.

Gadolinite, 219.  
 Gadolinium, 455.  
 Gaduine, 170.  
 Galactose, estimation of, 1089.  
 — fermentation of, 480.  
 — molecular weight of, TRANS., 463.  
 Galactosecarboxylic acid, oxidation of, 589.  
 Galactosone, 484.

- Galena, action of ferric chloride on, 947.
- Gallic acid, tests for, 447.
- — — thermochemistry of, 1096.
- Gallium, molecular weight of, TRANS., 531, 533.
- Galvanic circuit, production of the current in, 556.
- — — element, chemical theory of, 456.
- — — polarisation in the formation of persulphuric acid, 1041.
- Gas analysis, 185.
- — — by Bunsen's method, kaolin balls for, 544.
- — — technical, 924.
- — — coal-, estimation of benzene in, 190, 1036.
- — — disappearing in a reaction, apparatus for estimating, 300.
- — — generator with constant removal of the exhausted solutions, 1048.
- — — heating, 751.
- — — wood-petroleum, action of sulphuric and hydrochloric acids on, 187.
- Gaseous exchanges in plants, blood pigment as a gauge of, 182.
- Gases, action of, on the development of micro-organisms, 738.
- — — atmospheric, absorptive power of water for, 935.
- — — behaviour of, in relation to Boyle's law at low pressures, 98.
- — — composition of, lecture experiments on, 567.
- — — compressibility of, 95.
- — — dissolved in water, volumetric estimation of, 1034.
- — — electrolytic method of liquefying, 7.
- — — evolution of, from homogeneous liquids, 94.
- — — imperfect combustion in explosions of, 337.
- — — in plants, variation of, 641.
- — — lecture experiment on the volumetric composition of, 336.
- — — mixed, behaviour of at high pressures, 96.
- — — liquefaction of, 97.
- — — occluded, effect of, on the thermoelectric properties of compounds, 92.
- — — occlusion of, by electrolytic copper, 946.
- — — solubility of, 670.
- — — specific heats of, at constant volume, 459.
- Gasometry, graduation of tubes for, 301.
- Gastric juice, artificial, influence of, on the acetous and lactic fermentations, 1227.
- Gastric juice, estimation of free hydrochloric acid in, 302, 1242.
- — — free hydrochloric acid in, 734.
- — — influence of chlorides on the composition of, 1227.
- — — of crayfish, 534.
- Gehlenite in a furnace slag, 681.
- — — pseudomorphs of grossular after, 24.
- Gelatin, electrical conductivity of solutions of zinc sulphate containing, 809.
- — — oxidation of, with potassium permanganate, 629.
- Geology of the district of Ričán, 357.
- Germanium, detection of small quantities of, 78.
- Germination, influence of carbonic oxide on, 645, 739.
- Glass, analysis of, 1246.
- — — arsenic in, 341.
- — — solubility of, in water, 828.
- — — testing, by colour reactions, 549.
- Gluconic acid, preparation of, 857.
- — — reduction of, 1149.
- Glucose, action of chloral on, 845.
- Glucoses, constitution of, 32.
- Glucosone methylphenylhydrazone, 484.
- Glucosyringic acid, 159.
- Glucosyringinaldehyde, 159.
- Glutaric acid, behaviour of, on heating, 690.
- — — specific heat of, 93, 94.
- — — thermochemistry of, 1097.
- — — nitrile, heats of combustion and formation of, 812.
- Gluten and its presence in wheat grain, 296.
- — — chemistry of, 910.
- — — in wheat, 740, 919.
- Glyceria fluitans*, analyses of, 1078-1082.
- Glyceric acid, preparation of, PROC., 14.
- Glycerides, fatty, stability of, 1130.
- — — of butter fat, PROC., 5.
- Glycerol, amount of, in the residuary liquors of brandy distillation, 735.
- — — and alcohol formed in wines. influence of salicylic acid on the proportions of, 433.
- — — estimation of, in crude glycerol, 748.
- — — estimation of, in the residuary liquors of brandy distillation, 735.
- — — estimation of, in wine, 446.
- — — formation of, in alcoholic fermentation, 579, 1027.
- — — isotonic coefficient of, 9.
- — — nitro-, magnetic rotatory power of, TRANS., 685, 726.
- — — nutritive value of, 736.



Glycerol, oxidation of, 478.  
 Glycine anhydrides, substituted, 708.  
 Glycocine, preparation of, 590.  
 Glycocine-derivative of  $\alpha$ -thiophenic acid, 239.  
 Glycocine-derivatives, 143.  
 Glycocinephthaloylic acid, 590.  
 Glycogen, amount of, in the liver, 174.  
 — formation of, from carbohydrates, 631.  
 — formation of, in the organism, 174.  
 — in diabetic urine, 65, 293.  
 — in muscle after section of its nerve and its tendon, 64.  
 — in the muscles, effect of muscular work on, 428.  
 — influence of starvation on the, of the liver and muscles, 427.  
 — of muscle, source of, 428.  
 Glycogenesis in icterus, 1233.  
 Glycol, compound of chloral with, 689.  
 — compound of monosodium glycol with, 367.  
 — monosodium, alcoholates of, 562.  
 — nitro-, magnetic rotatory power of, *TRANS.*, 684, 726.  
 Glycollic acid in suint, 178.  
 Glycolyldibromorthotoluidide, 135.  
 Glycolyldiethoxyanilide, 1012.  
 Glycuronic acid, derivatives of, 377.  
 — anhydride, 378.  
 Glyoxalbutylene, 119.  
 Glyoxaline, isomeride of, 1214.  
 Glyoxalisobutylene, 120.  
 Glyoxylecyanide- $\alpha$ -hydrazone, 47.  
 Glyoxylecyanide- $\alpha$ -w-hydrazoxime, 48.  
 Glyoxylecyanide- $\alpha$ -methylphenylhydrazone, 49.  
 Glyoxylecyanide-osazone, 47.  
 Glyoxylecyanide-osotetrazone, 48.  
 Gold, action of silicon on, 1125.  
 — alluvial, genesis of, 835.  
 — and silver, estimation of, in potassium cyanide solutions containing them, 189.  
 — effect of, on the freezing point of sodium, *TRANS.*, 668.  
 — fine, errors in the assay of, 798.  
 — molecular weight of, *TRANS.*, 532, 533.  
 — sodium alloys, properties of, *TRANS.*, 670.  
 Gramineæ, source of the nitrogen of, 640.  
 Grammatite from Nordmarken, 221.  
 Granites from Riçan, 357.  
 Graphite from various metals, 343.  
 Grass, history of a field newly laid down to permanent, 910.  
 Grasses, nutritive value and produce of, 1077.  
 Grease, analysis of, 321.

Grossular, pseudomorphs of, after Gehlenite, 24.  
 Guaiacolphtaleïn, 1153.  
 Guaiacum resin, action of ozone on, 900.  
 Guanine, amount of in various organs, and in fresh and fermented yeast, 791.  
 — estimation of, 790.  
 — in the excrement of spiders, 430.  
 Guano, bat's, from Cuba, 436.  
 — fish, manuring with, 647.  
 Guanyl carbamide, preparation of, 951.  
 Gum, animal, in normal urine, 293.  
 — from *Araucarias*, 1236.  
 — wood-, 847.  
 Gums, examination of, 322.  
 Gun-cotton, estimation of calcium and magnesium in, 1032.  
 Gymnemic acid, 723.  
 Gypsum and anhydrite, relative rates of dissolution of, 466.  
 — solubility of, 16.

## H.

Hæmoglobin, amount of, in the blood during inanition, 531.  
 — and its derivatives in the bile, 1231.  
 — and protoplasm, reciprocal action between, 629.  
 — carbonic oxide-, behaviour of, 788.  
 — crystallised, 1223.  
 — in blood passing to and from the liver and spleen, 1023.  
 — reduced, 530.  
 Halogen mercuric acids, 1049.  
 — oxy-acids, products of the decomposition of the salts of, by heat, 338.  
 — — — rate of decomposition of the salts of, by heat, 338.  
 — salts, double, constitution of, 934.  
 Halogens, influence of, on the action of halogens on aromatic compounds, 240.  
 Hanksite, occurrence of in California, 471.  
 Harmaline, 731.  
 Harmalol, 730.  
 Harmine, 730.  
 Harmolic acid, 731.  
 Heart, effect of carbohydrates on the action of the, 1023.  
 — reduction of oxyhæmoglobin in, 1225.  
 Heat, atomic, of chromium, 1121.  
 — conductivity of mercury vapour for, 559.  
 — conductivity of mixtures of ethyl alcohol and water, 459.

- Heat, dilatation of salt solutions by, 204.  
 — isotherms of a mixture of sulphurous and carbonic anhydrides, 750.  
 — latent, of fusion, determination of, from the reduction of the freezing point, 666.  
 — — of vaporisation, 813.  
 — of combination of hydrogen with fluorine, 1096.  
 — of combustion, 814.  
 — — of acids of the oxalic and lactic series, 5.  
 — of acids of the aromatic series, 1096.  
 — — of benzene and other aromatic hydrocarbons, 1042.  
 — — of camphoric acids, 6.  
 — — of camphors and borneols, 328.  
 — — of carbon, 811.  
 — — of metaldehyde, erythrol, and tricarballic acid, 668.  
 — — of some organic substances, 5.  
 — of stilbene and the nono-naphthenes, 460.  
 — of terpinele, terpin hydrate, and terpin, 328.  
 — of dissociation of electrolytes, 1044.  
 — of dissolution of anhydrous lithium bromide, 1098.  
 — of anhydrous lithium iodide, 329.  
 — — of hydrated metallic salts, chlorides, 1043.  
 — — of sulphuric acid, *Proc.*, 88.  
 — of formation of alkaline carbonates in very dilute solution, 810.  
 — — of aniline dichromate, 562.  
 — — of antimony hydride, 666.  
 — — of benzene and other aromatic hydrocarbons, 1042.  
 — — of hydrated metallic chlorides, 1043.  
 — — of hyponitrites, 930.  
 — — of sorbic, terebic, cinnamic, and atropic acids, 460.  
 — of neutralisation of amines and alkalis, 811.  
 — — of malonic acid, 857.  
 — — of sulphuric acid, *Trans.*, 323.  
 — — specific, of gases at constant volume, 459.  
 — — of mercury, variation of with temperature, 750.  
 — — of saline solutions, 4.  
 — — of sea water of different densities, 666.  
 — — of some solid organic compounds, 92.  
 Heating by gas, 751.  
 Heats of combustion and formation of cyano- and nitro-camphors, 1098.
- Heats of combustion and formation of nitriles, 812.  
 — — — of organic compounds, 1096, 1097.  
 — — of dissolution and neutralisation of phenylenediamines, 1099.  
 — — of formation and dissolution of barium malonates, 958.  
 — — specific, at high temperatures, 4.  
*Hedera helix*, constituents of, 294.  
 Hederagluco-side, 294.  
 Hemipinic acid, 167.  
 Heptadecylene, 1126.  
 Heptene from perseitol, 361.  
 Heptylbenzyl cyanide, 862.  
*Herniaria hirsuta*, constituents of, 1003.  
 Herniarin, 1003.  
 Hexabenzoylmannitol, 1152.  
 Hexadecylamine, conversion of palmitonitrile into, 688.  
 Hexadecylphenetol, 129.  
 Hexahydroterephthalic acids, 1176, 1178.  
 Hexahydroxyanthraquinone, dichlor-, 405.  
 Hexamethylbenzene, heats of combustion and formation of, 1042.  
 Hexamethylenamine, action of nitrous acid on, 33.  
 — — dibromide, 579.  
 Hexamethylene, paradiamido-, 1147.  
 Hexamethylenedicyanhydrin, 1148.  
 Hexamethylphloroglucinol, 1153.  
 Hexamethyltriamidododinaphthylphenylmethane, 151.  
 Hexane, diamido-, and its derivatives, 976.  
 Hexaoxymethylene peroxide, 579.  
 Hexaoxymethylenediamine, 579.  
 Hexethylbenzene, 41.  
 Hexethyltriketohexamethylene, 247.  
 Hexyl alcohol, sulphonic acid of, 121.  
 — — iodide, from sorbite, 841.  
 Hexylacetylene, formation of from methylvalerylacetylene, 950.  
 Hexylbenzyl cyanide, 862.  
 Hexyldioxybenzoïn, 512.  
 Hexyldiphenyl tricyanide, 698.  
 Hexylene oxide, 839.  
 Hexylerythrols, 226.  
 Hippuramide, 286.  
 Hippuric acid, action of phthalic anhydride on, 708.  
 — — — action of sodium hypobromite on, 139.  
 Hippuroflavin, 252.  
 Hjelmite, 219.  
 Homoanthranilic acid, meta-, 1065.  
 Homomethylsalicylonitrile, 499.  
 Homo-orthophthalic acid, 256.  
 Homophthalopropylimide, 256.

- Homoptercarpin from red sandal wood, 160.  
Hornblende from Nordmarken, 221.  
Horse, change of substance in the, at rest and at work, 911.  
— fat, 1076.  
— sugar contents of the stomach of, 176.  
Humic acid, 285.  
Humorous substances, 285.  
Hungarian forage grass, analyses of, 1078—1082.  
Hyalotekite from Långban, 219.  
Hydantoin, nitro-, action of water on, 125.  
Hydantoins, 704.  
Hydra, digestion in, 287.  
Hydrargillite, 220.  
Hydrastaldehyde, 1221.  
Hydrastic acid, 1220.  
Hydrastine, 627, 908, 1220, 1221.  
— constitution of, 1222.  
Hydrastinic acid, 908, 1220.  
Hydrastinine, constitution of, 1222.  
— oxidation of, 627.  
Hydration versus electrolytic dissociation, 1099.  
Hydratropamide, 596.  
Hydratropic acid, preparation of, 596.  
Hydratropnitrile, 596.  
Hydrazine hydrate, 340.  
— constitution of, 587.  
— hydrochlorides, 340.  
— salts, 340.  
— sulphate, 340.  
Hydrazinebenzenedisulphonic acid, meta-, 397.  
— para-, 398.  
Hydrazinebenzeneparasulphonic acid, orthamido- and orthonitro-, 881.  
Hydrazinebenzenesulphonic acid, meta-, 397.  
Hydrazinedibromobenzenesulphonic acid, 398.  
Hydrazines, action of chloroform and alcoholic potash on, TRANS., 242.  
— condensation-products of, with aldehydes, 393.  
— unsymmetrical secondary aromatic, containing unsaturated alcohol radicals, 1161.  
Hydrazobenzene, dinitro-, 1160.  
— trinitro-, conversion of, into nitroso-dinitroazobenzene, 977.  
Hydrazobenzenedisulphonic acid, 399.  
Hydrazometaxylene, symmetrical and unsymmetrical, 136.  
Hydrazonopyruvic acid hydrazide, 36.  
Hydrazones, reduction of, 975.  
Hydrazoparaxylene, 136.  
Hydrazortho-xylene, consecutive, 135.  
Hydrazortho-xylene, unsymmetrical, 136.  
Hydrazoximes, 47.  
Hydrindene, tri-isonitroso-, 1067.  
Hydrindone,  $\alpha$ -, 1172.  
— dibrom-, 1173.  
Hydrindoneoxime,  $\alpha$ -, 1172.  
Hydriodic acid, magnetic rotatory power of, TRANS., 708, 739.  
Hydrobenzamide, action of amines on, 132.  
Hydrobromic acid, magnetic rotatory power of, TRANS., 706, 739.  
Hydrocarbon,  $C_{60}H_{122}$ , 575.  
Hydrocarbons, heavy, estimation of, 924.  
— higher aromatic, perhydrides of, 719.  
— of the allylene series, 840.  
— of the  $C_nH_{2n-2}$  series, 839.  
— of the diethylene series, 839.  
— solid in plants, 63.  
Hydrocarbostyrylcarboxylic acid, 1182.  
Hydrocerusite, artificial production and composition of, 21.  
Hydrochloric acid, action of, on the decomposition of chlorine-water by light, 1093  
— aqueous, coefficients of volatility of, 337.  
— coefficient of diffusion of, 1047.  
— diffusion of dilute aqueous ammonia into, 1046.  
— free, estimation of, in gastric juice, 302, 1242.  
— estimation of, in the stomach contents, 302.  
— in gastric juice, 734.  
— in solution, correspondence between the magnetic rotation and the refraction and dispersion of light by, TRANS., 758.  
— magnetic rotatory power of, TRANS., 703, 739.  
Hydrocyanic acid, physiological action of, 1232.  
Hydrodiquinoline, 905.  
Hydrofluoric acid, pure aqueous, preparation of, TRANS., 166.  
Hydrogen, absorption of, by metals, 558.  
— and fluorine, heat of combination of, 1096.  
— and nitric oxide, action of the electric spark on mixtures of, 15.  
— and nitrogen, simultaneous estimation of, 1031.  
— bromide, formation of, 754.  
— See also Hydrobromic acid.  
— compressibility of, 8, 562.  
— at very high pressures, 8.  
— critical-density of, 564.  
— critical-pressure of, 564.  
— critical-temperature of, 564.  
— critical-volume of, 564.  
— chloride. See Hydrochloric acid.

- Hydrogen fluoride, electrolysis of solution of, with carbon electrodes, 559.  
 ——— preparation of, TRANS., 167.  
 ——— vapour-density of, TRANS., 163.  
 ——— See also Hydrofluoric acid.  
 ——— iodide, formation of, 754.  
 ——— lecture experiments with, 754.  
 ——— oxidation of, by oxy-acids, 207.  
 ——— preparation of, 14.  
 ——— See also Hydriodic acid.  
 ——— occlusion of, 206.  
 ——— oxidation of, to hydrogen peroxide, 937.  
 ——— peroxide and chromic acid, interaction of, 350, 468, 571.  
 ——— chemically pure, preparation of, 101.  
 ——— estimation of, 301.  
 ——— evaporation of, 941.  
 ——— formation of, from persulphuric acid, 940.  
 ——— formation of, on exposure of mixtures of ether and water to light, PROC, 134.  
 ——— naphthylamine as a reagent for, in the presence of sodium chloride, 1242.  
 ——— oxidation of ammonia by, 939.  
 ——— oxidation of hydrogen to, 937.  
 ——— use of, in analysis, 546.  
 ——— preparation of, 465.  
 ——— relation between potential difference and striking distance in, at different pressures, 806.  
 ——— sulphide apparatus, 14.  
 ——— estimation of, 437, 1031.  
 ——— estimation of, in aqueous solution, 1031.  
 ——— evolution of, in urine, 432.  
 ——— telluride, 210.  
 ——— unsuccessful attempts to liquefy, 565.  
 Hydrohydrastinine, constitution of, 1222.  
 Hydroisopropylindole, 260.  
 Hydronaphthalenylamines, 1198.  
 Hydroxyridic bases, synthesis of, 1073.  
 Hydroquinoline, 903.  
 Hydroterephthalic acids, 1176.  
 Hydroxy-acids, behaviour of, towards the alkali hydrosulphides, 496.  
 Hydroxyammonium nitrilate, 497.  
 Hydroxyzelaic acid, 376.  
 Hydroxybenzalazine, ortho-, 393.  
 Hydroxybenzaldehydophenylhydrazone, meta-, 251.  
 Hydroxybenzaldehydophenylhydrazone, para-, 252.  
 Hydroxybenzaldehydes, mononitrated and their methyl-derivatives, 1168.  
 Hydroxybenzoic acids, action of iodine on, in alkaline solution, 1151.  
 ——— heats of combustion and formation of, 1096.  
 Hydroxybenzyl cyanide, para-, preparation of, 1173.  
 Hydroxybenzylamine, 1173.  
 Hydroxybenzylidenequinaldine, para-, 528.  
 Hydroxybenzylphthalimidine, para-, 983.  
 Hydroxybenzylthiocarbimide, para-, 1174.  
 Hydroxycamphoronic acids, 158.  
 Hydroxycaprylic acid, 372.  
 Hydroxycinchonine and its derivatives, 906.  
 Hydroxycinnamic acids, isomeric, 990.  
 ——— nitro-, 507.  
 Hydroxycinnamylhydantoïn bromide, 706.  
 Hydroxycresyl methyl ether, 499.  
 Hydroxydiethylmetadiazinecarboxylic acid, 686.  
 Hydroxy- $\alpha$ -dimethylquinoline, ortho-, 524.  
 ——— para-, 525.  
 Hydroxydinitrodiphenylamine, 772.  
 Hydroxydisulphonaphthoic acid,  $\alpha$ -, 719.  
 Hydroxyethylacetamide picrate, 1134.  
 Hydroxyethylaniline, 1219.  
 Hydroxyethylbenzamide, 1134.  
 Hydroxyethyldimethylamine,  $\beta$ -, 905.  
 Hydroxyethylidene- $\beta$ -naphthaquinaldine, trichloro-, 527.  
 Hydroxyethylmethylamine, 1218.  
 Hydroxyethylmethylorthamsidine, 1220.  
 Hydroxyethylorthamidophenol, 1219.  
 Hydroxyethylorthamsidine, 1219.  
 Hydroxyfluorene-carboxylic acid, 146.  
 Hydroxyhydroquinoxalines, 280.  
 Hydroxylamine, action of, on blood-pressure, 630.  
 ——— action of, on ethereal salts, 870.  
 ——— action of, on thiocarbamides, 1165.  
 ——— alkyl-derivatives of, 979.  
 ——— benzyl-derivatives of, 500, 703.  
 ——— constitution of, 1064.  
 ——— reactions of, 1163.  
 Hydroxylamines, isomeric monosubstituted, 607, 609.  
 Hydroxylaminesulphonates and their conversion into hyponitrites, TRANS., 760.  
 Hydroxymetatoluquinazoline,  $\delta$ -, 1065.  
 Hydroxymethylconiferin, 159.  
 Hydroxymethylconiferyl alcohol, 159.  
 Hydroxymethyldiethylmetadiazine, 577.  
 ——— isonitroso-, 685.

- Hydroxymethyldiphenylmetadiazine, 578.  
 Hydroxymethyltoluinoxaline, 280.  
 Hydroxymyristic acid, 956.  
 Hydroxy- $\alpha$ -naphthahydroxamic acid,  $\beta$ -, 871.  
 Hydroxy- $\beta$ -naphthahydroxamic acid,  $\alpha$ -, 267.  
 Hydroxynaphthaquinone anilide,  $\beta$ -, 267.  
 ———  $\beta\beta$ -chloro-, 268.  
 ——— nitro-, derivatives of, 1197.  
 Hydroxynaphthaquinonecarboxylic acid, chloro-, 153.  
 Hydroxynaphthaquinoneoxime, 887.  
 Hydroxynaphthoic acid,  $\alpha$ -, constitution of, 615.  
 Hydroxynaphthoic acid,  $\beta$ -, action of phosphorus pentachloride on, 514.  
 Hydroxy- $\alpha$ -naphthoic acids, chloro- and nitro-, 153.  
 Hydroxynaphthotrichloride diethyl-orthophosphate, 615.  
 Hydroxynaphthylphenyl, amido-derivatives of, TRANS., 124, 125.  
 Hydroxy- $\alpha$ -naphthylphenylamine,  $\alpha\beta$ -dichloro- $\beta$ -, 268.  
 Hydroxypentene, tetramido-, 770.  
 Hydroxyphenylacetamide, para-, 1173.  
 Hydroxyphenylacetic acid, para-, derivatives of, 1173.  
 Hydroxyphenylcarbamide, 394.  
 Hydroxy- $\alpha$ -phenyleinchonic acid, ortho-, 410.  
 Hydroxyphenyldibenzylmetadiazine, 684.  
 Hydroxy- $\alpha$ -phenylquinoline, ortho-, 410.  
 Hydroxy- $\alpha$ -pipecoline,  $\alpha'$ -, 904.  
 Hydroxypropylenediisoamylene, synthesis of, 118.  
 Hydroxyquinaldine methiodide,  $\gamma$ -, 519.  
 Hydroxyquinol, derivatives of, 389.  
 Hydroxyquinoline, action of chlorine on, 60.  
 ——— mono-, di-, and tri-chloro-, 60.  
 Hydroxyquinones, behaviour of, with mordants, 869.  
 Hydroxysulphonaphthoic acid,  $\alpha$ -, 719.  
 Hydroxysulphonebenzide, 245.  
 Hydroxyterephthalic acid, reduction-products of, 1180.  
 Hydroxytolylcarbamide,  $\omega$ -, 972.  
 Hydroxytolylphenylcarbamide,  $\omega$ -, 973.  
 Hydroxytolylphenylthiocarbamide,  $\omega$ -, 973.  
 Hydroxytriethylmetadiazine, 684.  
 Hydroxytrimethylenedipthalimide, 486.  
 Hydroxytriphenylmetadiazine, 684.  
 Hydroxytruxillic acid, 699.  
 Hygrine, 732.  
 Hyoglycholic acids,  $\alpha$ - and  $\beta$ -, 422.  
 Hyoscyamine, and atropine, relations between, 167.  
 Hypochlorous acid in alkaline solution, 672.  
 Hyponitrites, 944.  
 ——— constitution of, TRANS., 772.  
 ——— conversion of oxyamidosulphonates into, TRANS., 760.  
 ——— heat of formation of, 930.  
 Hypophosphates, 341.  
 Hypophosphites, the molybdate test for, 548.  
 Hypophosphoric acid, 341.  
 Hypoxanthine, amount of, in various organs and in yeast, 791.  
 Hystazarin-compounds, 719.  
 ——— tetracetyloxanthranol, 719.

## I.

- Icterus, 637.  
 ——— glycogenesis in, 1233.  
 Imido-group, action of nitric acid on the hydrogen of, 1145.  
 Imperialine and its derivatives, 284.  
 Inanition, amount of hæmoglobin in the blood during, 531.  
 Indene, dichloro-, 1173.  
 Indene-derivatives, synthesis of, 984.  
 Indigo stem, ash of, 794.  
 Indole from phenylamidoacetic acid, 1068.  
 ——— preparation of, 1187.  
 ——— reactions of, 1187.  
 Indole-acetoxime, 3', 712.  
 Indolecarboxylic acid, 2', action of acetic anhydride on, 712.  
 Indole-derivatives, 259, 1187.  
 ——— conversion of pyrroline-derivatives into, 400.  
 Indoles, 259.  
 Inulin, combination of, with copper oxide, 1133.  
 ——— molecular weight of, TRANS., 463.  
 Inversion of cane-sugar by acids, rate of change in, 1103.  
 Invertin, action of, on cane-sugar, 566.  
 Iodides, can the mucous membrane of the stomach decompose, 426.  
 ——— interaction of, with copper salts, PROC., 2.  
 Iodine chloride, modification of, 102.  
 ——— chlorine, bromine, and cyanogen, separation and estimation of, 304.  
 ——— detection of, in organic compounds, 796.  
 ——— estimation of, 185, 1086.  
 ——— trichloride, 102.  
 ——— vapour-density of, at a white heat, 674.

Iodochromic acid, non-existence of, 678.  
 Iodoform, action of sodium ethoxide on, 363,  
 — cryoscopic behaviour of solutions of, in benzene and chloroform, 821.  
 — decomposition and estimation of, by silver nitrate, 445.  
 — manufacture of, 1055.  
 — molecular reduction of the freezing point of benzene by, 566.  
 Iodomercuric acid, 1050.  
 Ions, absolute velocity of the, 1095.  
 — electromotive activity of the, 1095.  
 — free, in electrolytes, 558.  
 Ipecacuanha, evaluation of, 803.  
 Iridio-ammonium-compounds, 352.  
 Iron, absorption of hydrogen by, 568.  
 — amount of, in foetal tissues, 789.  
 — and aluminium, estimation of, in presence of calcium and phosphoric acid, 188.  
 — and manganese, separation of, 441.  
 — antimonates, 1124.  
 — detection of, in oil, 448.  
 — detection of minute quantities of, in minerals, 797.  
 — dissemination of sulphur and phosphorus through masses of, 13.  
 — dissolution of, in aqueous soda, 105.  
 — electrochemical effects of magnetising, 92.  
 — estimation of carbon in, 186, 308, 1088.  
 — estimation of, in cryolite, 927.  
 — estimation of phosphorus in, 76, 648.  
 — estimation of phosphorus in, in presence of silicon, 1245.  
 — estimation of sulphur and phosphorus in, 648.  
 — group, separation of, from calcium and magnesium, 441.  
 — industry, analysis of the raw materials and products of, 441.  
 — influence of copper on the determination of, in ferro-alloys, 798.  
 — methods of separating manganese and allied metals from, 309.  
 — new sulphide of, 677.  
 — nickel sulphide, 214.  
 — ores, estimation of titanium and phosphorus in, 189.  
 — of the Penokee-Gobec series of Michigan and Wisconsin, 473.  
 — periodates, TRANS., 149.  
 — pig, method of rapid evaporation for the estimation of silicon in, 1246.  
 — potassium cyanogen compound, new, 359.  
 — potassium thiocyanates, 1129.  
 — precipitation of, by nitroso- $\beta$ -naphthol, 442.

Iron, precipitation of, by zinc oxide, 442.  
 — relation of, to cobalt, as indicated by absorption-spectra, PROC., 14.  
 — spectro-colorimetric estimation of, 1247.  
 — sulphate, action of concentrated sulphuric acid on, 347.  
 — See also Ferrous and Ferric.  
 Isatinic acid, quinoline-derivatives from, 412.  
 Isatoic acid, metabrom-, 996.  
 — — synthesis of, 996.  
 Isatropic acid,  $\gamma$ -, 732.  
 — acids, 395.  
 — —  $\gamma$ - and  $\delta$ -, action of sulphuric acid on, 698.  
 — anhydride,  $\gamma$ -, 733.  
 — anhydrides, 395.  
 Isatropyl chloride,  $\delta$ - and  $\alpha$ -, 733.  
 Isatropylcocaine, poisonous properties of, 732.  
 Isatropylcocaines,  $\delta$ - and  $\gamma$ -, 733.  
 Isatropylecognines,  $\delta$ - and  $\gamma$ -, 733.  
 Isoallylene, 29.  
 — tetrabromide, 30.  
 Isoamylbenzene, amido-, 700.  
 — bromination of, 241.  
 — dispersive power of, 805.  
 Isoamylbromallylamine, 118.  
 Isoamylidibromopropylamine, 118.  
 Isoarabinc acid, 693.  
 Isoaustralene, 616.  
 Isobutyl chloride, action of zinc chloride on, in presence of hydrogen chloride, 842.  
 — ether, secondary, 477.  
 — — tertiary, 477.  
 — fluoride, 364.  
 — nitrate, magnetic rotatory power of, TRANS., 683.  
 — nitrite, 364.  
 — — and nitrate, correspondence between the magnetic rotation and the refraction and dispersion of light by, TRANS., 757.  
 — — magnetic rotatory power of, TRANS., 686, 727.  
 — sulphide, platinum compounds of, 368.  
 Isobutylamine, magnetic rotatory power of, TRANS., 694, 731, 735.  
 Isobutylbenzene, amidobromonitro-, 44.  
 — amidonitro-, 43.  
 — brom-, 43.  
 — diamido-, 43.  
 — diamidobromo-, 44.  
 — dibrom-, 45.  
 — dispersive power of, 805.  
 — influence of light on the bromination of, 240.  
 — metamido-, and its derivatives, 43.  
 — metanitro-, 43.

Isobutylbenzene, *paramido*-, derivatives of, 42.  
 ——— *paramido*-, properties of, 700.  
 Isobutyl dibromopropylamine, 117.  
 Isobutylene cyanide, 959.  
 Isobutylhydantoic acid, 706.  
 Isobutylhydantoïnamide, 706.  
 Isobutylphenol, *nitro*-, 43.  
 Isobutyramide, 381.  
 Isobutyric acid, *diiodo*-, 478.  
 Isocamphols, influence of solvents on the rotatory power of, 1206.  
 Isocamphoric acid, 899.  
 ——— *anhydride*, 899.  
 Isocarbopyrotartaric acid, 385.  
 Isocrotonylene dibromide, 576.  
 Iso- $\alpha$ - $\beta$ -dibenzoylcinnamene, *Proc.*, 138.  
 Isodihydroxybehenic acid, 956.  
 Isodulcitol, oxidation of, 952.  
 Isolepiden, *Proc.*, 139.  
 Isomalic acid, 377.  
 Isomerism and polymerism, use of Raoult's method for determining molecular weights to distinguish between, 754.  
 Isomorphous mixtures, specific gravity of, 931.  
 Isonononaphthene, heat of combustion of, 6, 460.  
 Isoperthiocyanic acid, 227.  
 Isophthalic acid, *diamido*-, 143.  
 ——— *dibrom*-, 143.  
 ———  *$\beta$ -nitro*-, 395.  
 ——— *nitro*-derivatives of, 142.  
 ——— *thermochemistry* of, 1096.  
 Isopropane, *nitro*-, action of alkalis on, 365.  
 ——— action of zinc ethyl on, 1127.  
 Isopropyl fluoride, 575.  
 ——— *sulphide*, platinum-compounds of, 367.  
 Isopropylbenzene, dispersive power of, 805.  
 ——— influence of light on the bromination of, 240.  
 Isopropylbenzoic acid, *para*-, *thermochemistry* of, 1096.  
 Isopropylcinnamaldehyde, *metanitro*- $\alpha$ -, 984.  
 Isopropyldeoxybenzoïn, 512.  
 Isopropylethylene, action of chlorine on, 113.  
 Isopropylindene, *amido*-, 984.  
 Isopropylindole (3'), 259.  
 Isopropylmalonic acid, *thermochemistry* of, 1097.  
 Isopropyl- $\alpha$ -phenylcinchonic acid, *para*-, 411.  
 Isopropyl- $\alpha$ -phenylquinoline, *para*-, 411.  
 Isoquinoline benzyl chloride, 165.  
 ——— *methiodide*, 415.  
 ——— *phenacyl bromide*, 165.

Isoquinoline, derivatives of, 165.  
 Isosuccinamide, 1143.  
 Isosuccinic acid, preparation of, 1056.  
 ——— specific heat of, 93, 94.  
 ——— acids, *bromo*-, electrolysis of, 1057.  
 Isothiobutaldehyde, 120.  
 Isothiocyanates, *TRANS.*, 300.  
 Isothiocyanacetic acid, 414.  
 Isotriacetylquinide, 991.  
 Isotrihydroxystearic acid,  $\beta$ -, 956.  
 Isovaleric acid, *sulpho*-, 35.  
 Isovalerylecgonine, 283.  
 Isoxylepidenic acid, *Proc.*, 139.  
 Itaconic acid, molecular refraction of, 198.

## J.

Jadeite, so-called, from Switzerland, 839.  
 Jaundice, biliary acids in the urine during, 637.  
 Jequirity, proteïd poisons of, 1026.  
 Jute fibre, nitration of, *TRANS.*, 201.  
 ——— preparation of furfuraldehyde from, *TRANS.*, 209.  
 ——— fibre-substance, constitution of, *TRANS.*, 199.

## K.

Kamacite, 766.  
 Kaolin balls for gas analysis by Bunsen's method, 544.  
 Ketazodiphenyl ketone, 1157.  
 Ketipic acid, 490.  
 Ketohexahydrobenzenedicarboxylic acid, 1181.  
 Ketohexahydrobenzoic acid, *meta*-, 1180.  
 Ketohydronaphthalene,  $\beta$ -,  $\alpha$ -pentachloro, 886.  
 ——— *tetrachloro*- and  $\beta$ -pentachloro-, 269.  
 Ketonaphthalene,  $\beta$ -,  $\alpha$ -dichloro-, 267.  
 ——— *hexachloro*-, 270.  
 ———  $\beta$ -trichloro-, 267.  
 ———  $\alpha$ -trichloro- and *tetrachloro*-, 268.  
 Ketone sulphites of organic bases, 234.  
 ——— *thiocyanates*, conversion of, into oxythiazoles, 413.  
 Ketones, behaviour of, towards sodium, 781.  
 ——— conversion of, into nitrosoketones, 584.  
 ——— *poly*-, passivity of certain, towards hydroxylamine and phenylhydrazine, 254.  
 ——— preparation of, 235.  
 ——— *thio*-derivatives of, 852.  
 Ketonic acids, 489.

Ketonic acid, action of hydrogen phosphide on, 35.  
 ——— condensation of, with bibasic acids, 1146.  
 ——— ethereal salts of, condensation of, with bibasic acids, 592.  
 ——— synthesis of, by the action of acid chlorides on propionitrile, 957.  
 Ketonic acids,  $\alpha$ -, synthesis of, 873.  
 Ketonic acids,  $\gamma$ -, 257.  
 ——— oxygen, substitution of the azo-group for, 1157.  
 Ketopiperazines, 1009.  
 Ketoquinoline, pentachloro, derivatives of, 62.  
 ——— trichloro-, 61.  
 Ketosulphides and ketosulphide acids, 488.  
 Ketoximodimethylacetic acid, 233.  
 Kidney, composition of a, which had undergone waxy degeneration, 536.  
 Kroehnkite, 680.

## L.

Lactic acid in the blood, 64.  
 ——— presence of, in pale and red muscle, 177.  
 ——— fermentation, influence of artificial gastric juice on, 1227.  
 Lactobionic acid, 485.  
 Lactylcarbamide, nitro-, action of water on, 125.  
 Lævomenthone, 721.  
 Laminaria, sugar-like compound from, 687.  
 Lanarkite from Leadhills, TRANS., 92.  
 Lanthanum metaphosphate, 746.  
 Lapachic acid, constitution of, 999.  
 ——— occurrence of, in bethabarra wood, 794.  
 Lapachone, constitution of, 1000.  
 Lard, adulteration of, 659.  
 ——— with cocoa-nut oil, 320.  
 ——— oil, density and refractive index of, 86.  
 ——— cotton-seed oil and beef fat in, 659.  
 ——— detection of cotton-seed oil in, 194, 319, 320.  
 Laurel leaves and berries, essential oil from, 1072.  
 Laurel-nut oil, 541.  
 Lead antimonate, 1124.  
 ——— compounds, aromatic, 400,  
 ——— ditolyl salts, 400.  
 ——— effect of, on the freezing point of sodium, TRANS., 675.  
 ——— estimation of, in tin-lead alloys, 309.  
 ——— ferricyanide compounds, 950.  
 Lead, molecular weight of, TRANS., 531, 533.  
 ——— periodates, TRANS., 149.  
 ——— peroxide, analysis of, 187.  
 ——— sulphide, action of ferric chloride on, 947.  
 ——— volumetric estimation of, in the presence of tin, 549.  
 Lead-cadmium alloys, TRANS., 679.  
 Leadhillite from Leadhills, TRANS., 91.  
 Lead-tin alloys, TRANS., 677.  
 ——— sp. gr. and composition of, 1051.  
 Lead-zinc alloys, TRANS., 678.  
 Leaves, evergreen, reserve materials, especially tannin, in, 540.  
 ——— rôle of tannin in, 917.  
 ——— variations in the amount of oxygen in, 641.  
 Lecithin in the seeds of plants, 645.  
 Lecture experiment: combination of nitric oxide and nitrogen, 754.  
 ——— composition of hydrogen chloride and other gases, 567.  
 ——— decomposition of carbon bisulphide by shock, TRANS., 220.  
 ——— Raoult's law, 336.  
 ——— volumetric composition of certain gaseous compounds, 336.  
 ——— with hydrogen iodide, 754.  
 ——— experiments with nitric acid, 672.  
 Leguminosæ in acid soils, 434.  
 ——— soluble carbohydrates in, 644.  
 ——— source of the nitrogen of, 640.  
 Lepiden, constitution of, 729.  
 ——— Zinin's, constitution of, PROC., 136.  
 Lepidolite, extraction of lithium from, 344.  
 Leuconic acid, oximes of, and their reduction-products, 769.  
 Levels, ether, 207.  
 Levulinic acid, chloro- and dichloro-, 489.  
 Levulose, rotatory power of, 479.  
 Ligamentum nuchæ, action of digestive fluid on, 912.  
 Light, action of, on moist oxygen, PROC., 134.  
 ——— decoloration and recoloration of litmus solutions by, 199.  
 ——— decomposition of the haloid salts of silver, by, 199.  
 ——— influence of, on the action of halogens on aromatic compounds, 240.  
 ——— oxidation by nitrosocamphor in presence of, 1:03.  
 ——— retraction and dispersion of, and magnetic rotation by compounds containing nitrogen, correspondence between, TRANS., 750.  
 ——— resistance to, of dyes fixed in tissues, 12.



Light, variation with temperature of the velocity of, in metals, 749.  
 Lignification, chemistry of, TRANS., 199.  
 Lignin, 1235.  
*Liliaceæ*, presence of salicylic acid in certain genera of the, PROC., 122.  
 Lime, absorptive power of sea sludge for, 1241.  
 — secretion of, by animals, 429.  
 Limonene-derivatives, rotatory power of, 1072.  
 Limonenenitrolanilines, 1071.  
 Limonenenitrolbenzylamines, 1070, 1072.  
 Limonenenitrolpiperidenes, 1070, 1072.  
 Limonenenitrosochlorides, 1069, 1072.  
 Linarite, from Leadhills, TRANS., 93.  
 Linoleic acid, falsification of oleic acid by, 799.  
 Linseed cake, estimation of fat in, 1251.  
 — estimation of oil and water in, 321.  
 Liquefaction of propylene, allylene, and trimethylene, 1126.  
 Liquids, expansion of, PROC., 89.  
 — homogeneous, evolution of gases from, 94.  
 — molecular volumes of, 566.  
 — volatile, elementary analysis of, 1088.  
 Lithia, heat of neutralisation of, 811.  
 Lithium antimonate, 1124.  
 — bromide, anhydrous, heat of dissolution of, 1098.  
 — chlorate, decomposition of by heat, 338.  
 — effect of, on the freezing point of sodium, TRANS., 675.  
 — extraction of, from its minerals, 344.  
 — iodide, anhydrous, heat of dissolution of, 329.  
 — molecular weight of, TRANS., 530, 533.  
 — molybdate, combination of, with tartaric acid, 860.  
 — perchlorate, decomposition of, by heat, 339.  
 Litmus purification of, 1086.  
 — solution, decoloration and re-coloration of, by light, 199.  
 — tincture of, decoloration of, in closed vessels, 67.  
 Liver, hæmoglobin in blood passing to and from, 1023.  
 — influence of arsenic and antimony on the glycogenic function and fatty degeneration of the, 537.  
 — influence of starvation on the glycogen of, 427.  
 — post-mortem formation of sugar in the, 176.

Logwood extracts, testing, 1091.  
 Lucerne, analyses of, 1078—1082.  
 — insoluble carbohydrate in, 643.  
 Lupine seeds, fat from, 296.  
 Lustre, metallic, 206.  
 Lutidone methiodide, 520.  
 Lycopodium, acids from, 1059.  
 — spores, constituents of, 741.

## M.

Mace oil, 1072.  
 Magenta, test for, in wine, 655.  
 Magnesia, precipitation of, 1087.  
 Magnesium, action of ammonia on, 345.  
 — aluminium, and calcium, separation of, 652.  
 — molecular weight of, TRANS., 531, 533.  
 — molybdate, combination of, with tartaric acid, 859.  
 — potassium bromide, 827.  
 — silicic, preparation of, 342.  
 — spectrum of, 89.  
 Magnet, action of a, on chemical action, 9.  
 Magnetic rotation and the refraction and dispersion of light by compounds containing nitrogen, correspondence between the, TRANS., 750.  
 — rotatory power of ammonium salts and amines, TRANS., 680.  
 — — of hydrochloric, hydrobromic, and hydriodic acids, TRANS., 702, 739.  
 — — of nitrogen-compounds, TRANS., 680.  
 Maize as dry food and as silage, 743.  
 — cane-sugar from, 918.  
 — silage, 743.  
 Malachite green, 260.  
 Maleic acid, action of, on aniline, 124.  
 — — and fumaric acid, isomerism of, 124.  
 — — conversion of, into fumaric amid, 1146.  
 — — ethereal salts of, 237.  
 — — molecular refraction of, 198.  
 — — thermochemistry of, 1097.  
 Maleinanil, 124.  
 Maleinimide, derivatives of, 384.  
 Maleinmethylinide, dibromo-, 57.  
 Malic acid, action of, on ammonium molybdate, 1147.  
 Malonic acid, action of phosphorus pentachloride on, 958.  
 — — behaviour of, on heating, 690.  
 — — heat of combustion of, 1097.

- Malonic acid, heat of neutralisation of, 857.  
 ——— specific heat of, 93, 94.  
 ——— thermochemistry of, 5, 857, 1097.  
 ——— nitrile, heats of combustion and formation of, 812.  
 Malt residues, formation of arabinose and xylose from, 480.  
 Maltobionic acid, 1132.  
 Maltodextrin, molecular weight of, TRANS., 465.  
 Maltose, oxidation of, 1132.  
 Mammalian red corpuscles, stromata of, 1231.  
 Man, influence of saline materials on gaseous metabolism in, 533.  
 Mandelic acids, nitro-, preparation of, 508.  
 Mandragora, alkaloids of, 1074, 1222.  
 Mandragorine, 1074, 1222.  
 Manganese and iron, separation of, 441.  
 ——— antimonate, 1124.  
 ——— degree of oxidation of, in fluorescent mixtures, 2.  
 ——— detection of, 653.  
 ——— error in separating, from much lime, 1087.  
 ——— estimation of, by means of hydrogen peroxide, 443.  
 ——— estimation of, in foods, 188.  
 ——— estimation of zinc in the presence of, 549.  
 ——— molecular weight of, TRANS., 532, 533.  
 ——— molybdate, 760.  
 ——— oxalate, 957.  
 ——— oxides, formation of deposits of, 21.  
 ——— ——— formation of, in the wet way, 829.  
 ——— peroxide, decomposition of potassium chlorate by heat in presence of, TRANS., 184.  
 ——— separation of, from the sesquioxide group and phosphoric acid, 309.  
 ——— sulphides, 677.  
 Manganese-epidote from Sweden, 221.  
 Manganophyll from Långban, 221.  
 Manganous carbonate, action of air on, 830.  
 ——— salts, titration of, with potassium manganate, 798.  
 Mannitol, benzoic acetals of, 233.  
 ——— combination of, with aldehydes of the acetic series, 580.  
 ——— combination of, with copper oxide, 1133.  
 ——— from fungi, 740.  
 Mannose, 480, 687.  
 ——— action of hydrocyanic acid on, 482.  
 ——— constitution of, 483.  
 Mannosecarboxylic acid and its derivatives, 482.  
 ——— ——— reduction of, 1149.  
 Mannosehydrazone, 481.  
 Manure heaps, calcium sulphite as a preventive of loss of nitrogen in, 184.  
 ——— value of basic slag as, in comparison with soluble phosphate and bone meal, 299.  
 Manures, estimation of ready formed nitrogen in, 649.  
 ——— formation of, 739.  
 Manurial value of several marine products, 1085.  
 Manuring experiments on heavy soil, 300.  
 ——— of barley, 743.  
 ——— of cereals with phosphates, 1242.  
 ——— of rice, 646.  
 ——— with fish guano, 647.  
 Marble, solubility of, in sea water, 682.  
 Margarin, detection of, in butter, 318.  
 Matter, properties of, in the gaseous and liquid state under various conditions of temperature and pressure, 95.  
 Meadow grass, smooth stalked, analyses of, 1078—1082.  
 Meconarceine, 906.  
 Melamine, formation of, 951.  
 Melanuria, urine in, 637.  
 Melanuric acid, formation of, 954.  
 Melibiose, 953.  
 Melitose, 953.  
 Melitriose, 953.  
 Mellitic acid, thermochemistry of, 1096.  
 Mellityl acetate, 875.  
 ——— alcohol, 875.  
 ——— chloride, 875.  
 Menthene, transformation of terpineol into, 276.  
 Menthol, constitution of, 723.  
 ——— specific rotatory and refractive powers of, 453.  
 Menthone, 721.  
 Mercaptan, amido-, 870.  
 Mercaptans, reagents for, 655.  
 Mercaptophthalimide, 870.  
 Mercaptothiazoline,  $\mu$ -, and its methyl ether, 849.  
 Mercurammonium chloride mercurichromate, 1120.  
 ——— chlorides, properties of, 570, 827.  
 ——— hydroxide, hydrate of, 347.  
 ——— salts, 347.  
 Mercuric acids, halogen-, 1049.  
 ——— antimonate, 1124.  
 ——— chloride and chromates, compounds of, 1120.  
 ——— ——— volumetric estimation of, 78.  
 ——— chlorothiocyanate, TRANS., 50.

- Mercuric cyanide, action of copper salts on, 359.  
 Mercurous salts, action of ammonia on, 675.  
 ——— action of soda on, 346.  
 Mercury, action of silicon on, 1125.  
 ——— and copper, electrolytic method of separating, 797.  
 ——— compounds, ammoniacal, 347.  
 ——— detection of, 651.  
 ——— in minerals, 797.  
 ——— dipentamethylphenyl, 876.  
 ——— effect of, on the freezing point of sodium, *TRANS.*, 672.  
 ——— electrical resistance of, 201, 202.  
 ——— electrolytic detection of, 441.  
 ——— estimation of, 927.  
 ——— oxychlorides, 1050.  
 ——— purification of, 17.  
 ——— salicylates, 1062.  
 ——— salts, action of sodium thiosulphate on, 1108.  
 ——— solid, electrical conductivity of, 557.  
 ——— vapour, conductivity of, for heat, 559.  
 ——— vapour-density of, at a white heat, 674.  
 ——— variation in the specific heat of, with temperature, 750.  
 ——— volumetric estimation of, 1246.  
 Mesoconic acid, molecular refraction of, 198.  
 Mesoconilic acid, 1174.  
 Mesityl oxide, nitroso-, 585.  
 Mesitylenic acid, thermochemistry of, 1096.  
 Mesocamphoric acid, 898.  
 Metabolism, gaseous, in man, influence of saline materials on, 533.  
 ——— in man, influence of ethyl alcohol on, 288.  
 ——— of acetanilide in the human body, 289.  
 ——— of furfuraldehyde in fowls, 289.  
 ——— proteid in man, 174.  
 ——— influence of urethane, paraldehyde, antipyrin, and antifebrin on, 534.  
 Metacetone, nonexistence of, 487.  
 Metadiazines, 1006.  
 Metaformaldehyde, 369.  
 Metahemipinic acid, 167.  
 Metal and its salt, contact potential of, 661.  
 ——— masses of, dissemination of sulphur and phosphorus in, 13.  
 Metaldehyde, heat of combustion of, 668.  
 Metallic lustre, 206.  
 ——— sulphides, 677.  
 Metals, absorption of hydrogen by, 568.  
 Metals and acids, interaction of, *TRANS.*, 361; *PROC.*, 66.  
 ——— apparatus for the electrolytic estimation of, 548.  
 ——— electrolytic polarisation by, 663.  
 ——— heavy, acid character of the salts of, 569.  
 ——— affinity of, for sulphur, 468.  
 ——— lowering of the freezing point of sodium by the addition of, 666.  
 ——— mechanical properties of, in relation to the periodic law, 105.  
 ——— method of investigating the dissolution of, in acids, *TRANS.*, 361.  
 ——— molecular weights of, *TRANS.*, 521.  
 ——— positive, effects of various, on the change of potential of a voltaic couple, 201.  
 ——— spectra of, 1.  
 ——— variation with temperature of the velocity of light in, 749.  
 Metamorphic and plutonic rocks at Ormeo, 222.  
 Metaphosphates, molecular weight of, 674.  
 Metaphosphoric acid, rate of transformation of, 671.  
 Metasaccharic acid, 590.  
 Metastannic acid, behaviour of, to bismuth and iron oxides, 1052.  
 ——— heat of neutralisation of, 833.  
 Metatungstic acid, 832.  
 Meteoric iron from Portugal, 839.  
 ——— irons, 358.  
 Meteorite at Eagle Station, Kentucky, 765.  
 ——— from Novo-Urei, 224.  
 Meteorites from Ochansk, 358.  
 ——— of Shalka and Manbhoom, 574.  
 Methæmoglobin, estimation of, in presence of oxyhæmoglobin, 660.  
 Methronic acid, 592.  
 Methane and nitric oxide, action of the electric spark on mixtures of, 15.  
 ——— bromonitro-, action of zinc ethyl on, 1128.  
 ——— estimation of, 924.  
 ——— nitro-, action of ammonia on, 365.  
 ——— action of zinc methyl on, 113.  
 ——— magnetic rotatory power of, *TRANS.*, 687.  
 Methenylphenylazidine, 1164.  
 Methose, 583.  
 Methoxybenzaldehyde, orthonitro-, 989.  
 Methoxybenzaldehydes, nitrometa-, the four isomeric, 1169.  
 Methoxybenzaldoxime, para-, 254.  
 Methoxybenzenylacetylamidoxime, para-, 254.

- Methoxybenzenylamidoxime, ortho-, 255.  
 — para-, 254.  
 — ethyl ether, 254.  
 Methoxybenzenylazoximebenzenyl, ortho-, 255.  
 — para-, 254.  
 Methoxybenzenylazoximepropenyl -  $\omega$  - carboxylic acid, para-, 255.  
 Methoxybenzenylethenylazoxime, para-, 254.  
 Methoxybenzenylethylideneimidoxime, para-, 254.  
 Methoxybenzenylimidoximecarbonyl, para-, 254.  
 Methoxybenzoic acid, nitrometa-, 1169, 1170.  
 Methoxybenzonitrile, ortho-, 255.  
 — para-, 254.  
 Methoxybenzoylbenzenylamidoxime, para-, 254.  
 Methoxybenzyl cyanide, para-, 1173.  
 Methoxycinnamaldehyde, nitro-, 990.  
 Methoxycinnamic acid, orthonitro-, 989.  
 Methoxylutidine, 520.  
 Methoxynaphthalenesulphonic acids,  $\beta$ -, Proc., 73.  
 Methoxyphenylacetamide, para-, 1173.  
 Methoxyphenylacetic acid, parabromo-, 1174.  
 Methoxyquinaldine methiodide,  $\gamma$ -, 520.  
 Methoxyquinol, 390.  
 Methoxyquinone, derivatives of, 389, 390.  
 Methoxyquinoneanilide, 389.  
 Methoxyquinoneanilide, 390.  
 Methoxyquinoneortho-xylidide, 390.  
 Methoxyquinonetoluidides, 390.  
 Methronic acid, identity of, with sylvanecarboxylic acid, 126.  
 Methyl acetylcarbamate, 1144.  
 — acetylenedicarboxylodiazacetate, 694.  
 — alcohol, estimation of acetone in, 313.  
 — — estimation of, in wood spirit, 84.  
 — — physical properties of, 578.  
 — allyl carbinol, oxidation of, 231.  
 — benzilate, 885.  
 — butrylcarbamate, 1144.  
 — carboxycarbamate, 1144.  
 — cocaylbenzoylhydroxyacetate, 420.  
 — cyanide, dimolecular, 683.  
 — — polymeride of, 113.  
 — cyanomalonate, 859.  
 — diazoacetate, action of, on ethereal salts of unsaturated acids, 694.  
 — dichloroterephthalate [para-], 1179.  
 — dimethamidobenzoate, para-, 512.  
 — dimethylcarbamate, 1144.  
 Methyl dinitrophenylacetateazobenzene, 506.  
 — dinitrophenylacetateazotoluene, 506.  
 — dinitrophenylacetateazo-xylene, 506.  
 — ethyl pyrotritartrate, 385.  
 — ethylenediamidoformate and its nitro-derivatives, 124.  
 — fluoride, 364, TRANS., 110.  
 — — action of chlorine on, TRANS., 111.  
 — hydrocarbostyrlcarboxylate, 1182.  
 — hydroxyphenylacetate, [para-], 1173.  
 — iodide, action of, on sodium arsenite, 363.  
 —  $\alpha$ -methyl- $\beta$ -chlorotetracrylate, 488.  
 —  $\alpha$ -methyl- $\beta$ -ethoxytetracrylate, 488.  
 — methylnitrocarbamate, 1145.  
 — methyloxamate, 1145.  
 — methylphenylacetate, [meta-], 255.  
 —  $\alpha$ -methyl- $\beta$ -propioxytetracrylate, 488.  
 — nitrate, magnetic rotatory power of, TRANS., 682.  
 — nitroisosuccinate, 1143.  
 — nitromalonate, 1143.  
 — nitrosoparadimethamidobenzoate, 512.  
 — pentamethylbenzoate, 876.  
 — pentamethylenediamidoformate, 492.  
 — pentamethylenedinitramidoformate, 492.  
 — pentamethylphenyl ketone, 875.  
 — phenylcarbamate, sulphonic acid of, 144.  
 — pyridyl ketone,  $\beta$ -, 623.  
 — pyrotritartrate, 384.  
 — salicyl aldehyde, melting points of, TRANS., 550.  
 — sulphaminebenzoate, [ortho-], 992.  
 — sulphide, platinum-compounds of, 229.  
 — trimethylaesculate, 256.  
 — trimethylenediamidoformate, 492.  
 — trimethylenedinitramidoformate, 492.  
 — trinitromethylnitramidophenate, 1154.  
 —  $\beta$ -truxillate, 1194.  
 Methylacetanilide, 704.  
 Methylacetyltetrahydrobenzene, ortho-, Proc., 144.  
 Methylamidomethylnitramidobenzene, trinitro-, 1154.  
 Methylamine, heat of neutralisation of, 811.  
 — properties of, 688.  
 Methylamylacetylene, hydration of, 227.

- Methylanhydroecgonine methiodide, 170.  
 Methylaniline, estimation of, 1038.  
 Methylarabinose, 952.  
 Methylarsen disulphide, 363.  
 Methylbenzimidine chloride, conversion of, into triphenylbenzene, 998.  
 Methylbenzoylenecarbamide,  $\alpha$ - and  $\gamma$ -, 610.  
 Methylbenzylbromobenzeneazammonium iodide, 503.  
 Methylbenzylthiocarbamide, TRANS., 619.  
 Methylbromodiketohydrindene, 1068.  
 Methylcolchicine, 282.  
 Methylcoumaric acid, orthonitro-, 989.  
 Methylcyanacetophenone, ortho-, 874.  
 Methyldeoxybenzoins, isomeric, 883.  
 Methyl- $\alpha$ - $\omega$ -diacetylpentane, TRANS., 346.  
 Methyl-diethylmetadiazine, amido-, 577.  
 Methyl-dihydroparvoline, 59.  
 Methyl-dihdropentene methyl ketone, PROC., 142.  
 Methyl-dihdropentenedicarboxylic acid, PROC., 142.  
 Methyl- $\alpha$ - $\gamma$ -diketohydrindene,  $\beta$ -, 1068.  
 Methyl-dioxindole, TRANS., 8.  
 Methyl- $\psi$ -dioxythiazole,  $\nu$ -, 414.  
 Methyl-diphenyl tricyanide, 696.  
 Methyl-diphenylmetadiazine, amido-, 578.  
 Methyl-3-diphenyl-5-phenylpyrrolidone, 1-, PROC., 140.  
 Methyl-3-diphenyl-5-phenylpyrrolone, 1-, PROC., 140.  
 Methylene chlorofluoride, TRANS., 112.  
 — iodide, action of sodium ethoxide on, 363.  
 Methylene-blue group, 775.  
 Methylene-dimethylsulphone, 1232.  
 Methylene-thylacraldehyde, action of ammonia on, 120.  
 — action of sulphurous acid on, 121.  
 Methylene-thylene- $\psi$ -thiocarbamide, 849.  
 Methylene-thylhexamethylene, formation of, PROC., 143.  
 Methylene-thylisopropylmetadiazine, amido-, 578.  
 Methylene-thylmalonic acid, thermochemistry of, 1097.  
 Methylene-thylpentamethylene, PROC., 143.  
 Methylfurfuraldehyde, 695.  
 Methylglutaric acid, thermochemistry of, 1097.  
 Methylglyoxal- $\alpha$ - $\omega$ -hydrazoxime, 47.  
 Methylglyoxaline, 867.  
 Methylglyoxal- $\alpha$ - $\omega$ -methylphenylhydrazoxime, 48.  
 Methylglyoxalallosazone hydrochloride, 47.  
 Methylhexadecylbenzene, amidopara-, 130.  
 — ortho- and meta-, 129.  
 — para-, 130.  
 Methylhexadecylphenetol, para-, 130.  
 Methylhexadecylphenol, 130.  
 Methylhexamethylene methyl carbinol, ortho-, PROC., 144.  
 Methylhexyldiphenolmethane, 1187.  
 Methylhydantoin, 1143.  
 — nitro-, 1143.  
 Methylhydroxythiazolecarboxylic acid, 725.  
 Methylhydroxytoluinoxaline, di-bromo-, 238.  
 Methylimidazole, 867.  
 Methylimidazolyl methyl sulphide, 866.  
 — mercaptan, 866.  
 Methyl- $\mu$ -imidothiazolidine,  $\nu$ -, 849.  
 Methylindene, chloro-, 984.  
 Methylindole, 1', TRANS., 1.  
 Methylisocallylene, 361.  
 Methyl-lutidone, 519.  
 Methylmalonic acid, thermochemistry of, 1097.  
 Methylmetanitriline, action of diazotised parabromaniline on, TRANS., 426.  
 Methylmethenyltoluylenediamine, 731.  
 Methylmethronic acid, 593.  
 Methyl- $\mu$ -methylamidothiazole,  $\alpha$ -, 415.  
 Methylmorphimethine, 217.  
 Methylmorpholine, 1218.  
 Methylmorpholinemethylammonium iodide, 1219.  
 Methyl-nitramine, 492.  
 — preparation of, 1144.  
 Methyl-nitrosoacetonehydrazone, 47.  
 Methylorthotolylthiocarbamide, TRANS., 621.  
 Methylorthuramidobenzoyl, meta-, 1066.  
 Methyloxazoline picrate, 1134.  
 Methyloxindole, bromo-, TRANS., 7.  
 — dibromo-, TRANS., 3.  
 — dichloro-, TRANS., 4.  
 Methylparabromaniline, action of diazotised metanitriline on, TRANS., 425.  
 — action of diazotised paranitriline on, TRANS., 418.  
 — action of diazotised paratoluidine on, TRANS., 433.  
 Methylparachloraniline, action of diazotised paratoluidine on, TRANS., 436.  
 Methylparahydroxybenzoic acid, heats of combustion and formation of, 1096.  
 Methylparamidodiphenylmethane, 261.  
 Methylparanitriline, action of diazotised parabromaniline on, TRANS., 419.

- Methylparatoluidine, action of diazotised parabromaniline on, *TRANS.*, 432.  
 — action of diazotised parachloraniline on, *TRANS.*, 436.  
 Methylparatolylthiocarbamide, *TRANS.*, 620.  
 Methylpentamethylene methyl carbinol, *PROC.*, 143.  
 Methylphenanthrolines, isomeric, 520, 521.  
 Methylphenomorpholine, 1220.  
 Methylphenylacetic acid, dinitrometa-, 255.  
 Methylphenylglucosazone, 484.  
 Methylphenylhydroxypyrimidine, 1007.  
 Methylphenylindole, 2' : 3', 260.  
 Methyl- $\mu$ -phenylselenazole- $\beta$ -carboxylic acid,  $\alpha$ -, 727.  
 Methyl- $\alpha$ -phenylthiazole,  $\mu$ -, 724.  
 Methylphenyltoluinoxaline, 1171.  
 Methylphthalimide, 141.  
 Methylphthalimidine, 141, 253.  
 Methylpiaselenole, 785.  
 Methylpseudoisatin, *TRANS.*, 5.  
 Methylpseudoisatinoxime, *TRANS.*, 6.  
 Methylpseudoisatinphenylhydrazone, *TRANS.*, 5.  
 Methylpyrazolone, 393.  
 Methylpyridinecarboxylic acid, 163.  
 Methylpyromucic acid, 695.  
 Methylpyrrolidine, 2-, 1015.  
 Methylpyrrolidone, 961.  
 Methylpyrrolidonecarbonitrile, 1212.  
 Methylpyrrolone, derivatives of, 57.  
 Methylpyrrolone,  $\alpha$ -, action of methyl iodide on, 728.  
 Methylpyrrolones, 2- and 3-, 1209.  
 Methylpyrryl cinnamyl ketone, 2-, 1209.  
 Methylpyrrylglyoxylic acid, 57.  
 Methylquinaldone, 519.  
 Methylquinol, metiodo-, 993.  
 Methylquinoline, ananitro- $\gamma$ -bromo-, 728.  
 Methylquinone, metadiiodo-, 994.  
 — metiodo-, 993.  
 Methylscopoletic acid, 256.  
 Methylscopoletin, 256.  
 Methylselenazole, amido-, 726.  
 Methylselenazylamine,  $\alpha$ -, 726.  
 Methylselenazylamine- $\beta$ -carboxylic acid,  $\alpha$ -, 727.  
 Methylstilbazole and its reduction-products, 162.  
 Methylstilbazoline, 163.  
 Methylsuccinic acid, thermochemistry of, 1097.  
 Methylsuccinimide, 1061.  
 Methylsyringic acid, 159.  
 Methyltetrahydrophenyl methyl carbinol, ortho-, *PROC.*, 144.  
 Methyltetrahydrophenyl methyl ketone, ortho-, *PROC.*, 144.  
 Methyltetraphenylpyrrolone, 623.  
 Methylthiazole,  $\alpha$ -, 725.  
 Methylthiazole,  $\mu$ -, 734.  
 Methylthiazolehydroxamic oxide, 725.  
 Methylthiazylamine, 414.  
 Methylthiazylaniline,  $\alpha$ -, 415.  
 Methyltrichlorobromazimidobenzene, 502.  
 Methylurethane, 492.  
 Methylurvic acid, 594.  
 Methylvalerylacetylene, formation of hexylacetylene from, 950.  
 Methysticin, 278.  
 Mica, artificial formation of, 25.  
 — electrolytic behaviour of, at high temperatures, 664.  
 Microchemical reactions, 78.  
 Micro-organisms, action of gases on the development of, 738.  
 — action of, on certain colouring matters, 67.  
 — and proteolytic digestion, 64.  
 Milk, alcoholic fermentation of, 916.  
 — analysis, 1090.  
 — boiled, digestibility of, 1225.  
 — composition of, produced on English dairy farms, 914.  
 — cow's, citric acid in, 178.  
 — — specific gravity of, 915.  
 — estimation and detection of sodium hydrogen carbonate in, 1244.  
 — estimation of fat in, 1037.  
 — estimation of milk-sugar in, by the polariscope, 315.  
 — proteids of, 450.  
 — the salts of, and their relation to the behaviour of casein, 634.  
 — volumetric estimation of fat in, 1250.  
 Milk-serum, analysis of, 634.  
 Milk-sugar, oxidation of, 485.  
 Mimetesite, preparation of, 21.  
 Mineralogical notes, 24, 220, 356.  
 Minerals, detection of mercury in, 797.  
 — detection of minute quantities of iron in, 797.  
 — from Leadhills, *TRANS.*, 91.  
 — from the Douglasshall salt mine, 838.  
 — of the Pacific coast, 472.  
 — of the Tyrol, 23.  
 — solubility of, in sea water, 682.  
 Mineral-springs in the Admirals-gartenbad, Berlin, 27.  
 Molasses, estimation of sugar in, 191.  
 Molecular groups in solutions, evidence afforded by fluorescence and absorption of the decomposition of, 554.  
 — lowering of the freezing point of benzene by phenols, 101.

Molecular refraction, 454.  
 — volumes of liquids, 566.  
 — weight, determination of from the rise of boiling point, 933.  
 — — — determination of the, of substances in solution, especially colloids, *Proc.*, 109.  
 — — — determinations from osmotic pressure, 820.  
 — — — of aluminium chloride, 1113.  
 — — — of aluminium compounds, 757.  
 — — — of amyloextrin, *TRANS.*, 455.  
 — — — arabinose, dextrose, and xylose, 367.  
 — — — caoutchouc and of other colloids, 1207.  
 — — — of paraformaldehyde, 369.  
 — — — of sulphur, 340.  
 — weights, determination of, by reduction of the freezing point, 11.  
 — — — of acids of the oleic series, 1140.  
 — — — of dissolved substances, estimation of, 820.  
 — — — of polymeric compounds, determination of, by Raoult's method, 1105.  
 — — — of some metaphosphates, 674.  
 — — — of the carbohydrates, *TRANS.*, 462.  
 — — — of the metals, *TRANS.*, 521.  
 Molybdates, crystalline, 760.  
 Monazite, analyses of, 217.  
 — as a secondary constituent of rocks, 573.  
 — from North Carolina, 356.  
 Money, Manila, analysis of, 17.  
 Mordants, substances which form coloured compounds with, 868.  
 Morphine, 905.  
 — action of alcoholic potash on, 1018.  
 — compounds, cryoscopic behaviour of solutions of, 933.  
 — constitution of, 417, 906, 1018.  
 — in *Escholtzia Californica*, 644.  
 — water of crystallisation of, 417.  
 Morpholine, 1218.  
 Morrhuc acid, 170.  
 Morrhucine, 63.  
 Mortar, ancient, from a Roman wall in London, 16.  
 Mules, digestion in, 533.  
 Muscle, amount of urea in, 914.  
 — effect of muscular work on the glycogen of the, 428.  
 — fibres, sarcolemma of, action of digestive fluids on, 913.  
 — glycogen in the, after section of its nerve and its tendon, 64.  
 — influence of starvation on the glycogen of, 427.

Muscle, pale and red, presence of lactic acid in, 177.  
 — pigments, 633, 1231.  
 — source of the glycogen of the, 429.  
 Mussel shells, manurial value of, 1085.  
 Mustard oil, density and refractive index of, 86.  
 — white, ethereal oil of, 1173.  
 Myohæmatin, 1024.  
*Myoporum platycarpum*, resin of, *TRANS.*, 665.  
 Myosin, 423, 530.  
 Myosinoses, 423.  
 Myristic acid, amido-, 956.  
 — — — anilido-, 957.  
 — — — bromo-, 956.  
 — — — aldehyde, 1017.  
 Myrtle, oil of, 616.  
 Myxœdema, 179.

## N.

Naphthalenzaldoxime,  $\alpha$ -, 1200.  
 Naphthalenylideneaniline,  $\alpha$ -, 1199.  
 Naphthalenylidene- $\alpha$ -naphthylamine,  $\alpha$ -, 1199.  
 Naphthalenylideneorthotoluidine,  $\alpha$ -, 1199.  
 Naphthalenylideneparatoluidine,  $\alpha$ -, 1199.  
 Naphthacinnamene,  $\alpha$ -, 1200.  
 Naphthacinnamic acid,  $\alpha$ -, 1200.  
 Naphthaglycollic acid,  $\alpha$ -, 1200.  
 — nitrile,  $\alpha$ -, 1200.  
 Naphthahydrocinnamic acid, dibromo-, 1200.  
 Naphthaldehyde,  $\alpha$ -, condensation-products of, 1199.  
 Naphthalene, amidoazo-, formation of pyridine from, 728.  
 — — — preparation and reduction of, 607.  
 —  $\beta$ -chloro- $\alpha$ -bromo-, 614.  
 — constitution of  $\alpha\alpha$ -disubstituted compounds of, 156.  
 —  $\alpha$ - and  $\beta$ -cyano, behaviour of with sulphonating agents, *Proc.*, 122.  
 —  $\alpha\beta$ -dichloro-, 149.  
 —  $\eta$ -dichloro-, constitution of, *Proc.*, 49.  
 — heats of combustion and formation of, 1042.  
 — heteronuclear  $\alpha\beta$ - and  $\beta\beta$ -derivatives of, constitution of, *Proc.*, 34, 48.  
 —  $\beta$ -iodo-, sulphonation of, *Proc.*, 75.  
 — molecular volume of, 336.  
 —  $\alpha$ -nitro-, action of sulphuric acid on, 153.

- Naphthalene nitro- $\beta$ -chloro, PROC., 71.  
 — series, reduction of the azo-dyes of the, 270.  
 Naphthalene-derivatives, formation of sulphones on sulphonating, PROC., 121.  
 Naphthalenedisulphochloride,  $\beta$ -chloro-, 276.  
 Naphthalenes, dichloro-, 150.  
 — dichloro-, constitution of, 265.  
 — disubstituted, from the isomeric chlorophenylparaconic acids, 150.  
 —  $\alpha$ - and  $\beta$ -fluoro-, 999.  
 — 1 : 3-homo- and the isomeric hetero- $\alpha\beta$ -dichloro-, PROC., 5.  
 Naphthalenesulphonic acid,  $\gamma$ -amido-, 154.  
 — —  $\delta$ -amido-, and its derivatives, 155.  
 — — 2 : 1'-bromo-, 894.  
 — — 2 : 3'-bromo-, 894.  
 — —  $\beta$ -chloro-, 54.  
 — — 1 : 4'-fluoro-, 1001.  
 Naphthalene- $\beta$ -sulphonic acid, nitration of, PROC., 17.  
 — — sulphonation of, PROC., 10.  
 Naphthalenesulphonic acids,  $\beta$ -bromo-, 894, PROC., 118.  
 — —  $\alpha$ -chloro- $\beta$ -amido-, isomeric, PROC., 36, 48.  
 — —  $\beta$ -iodo-, PROC., 119.  
 — —  $\alpha$ -nitro- and  $\alpha$ -amido-, 154.  
 Naphthapiaselenole, 786.  
 Naphthaquinaldine,  $\beta$ -, and its derivatives, 525.  
 Naphthaquinolinecarboxylic acid,  $\beta$ -, 526.  
 Naphthaquinolines, octohydro-derivatives of, 518.  
 Naphthaquinolinesulphonic acid,  $\beta$ -, oxidation of, 527.  
 Naphthaquinone-anilide, anilidonitro-, 266.  
 — — chloride,  $\beta$ -, 267.  
 — —  $\alpha$ -chloro- and dichloro- $\beta$ -, 268.  
 — —  $\beta$ -chloro-,  $\beta$ -, 267.  
 — —  $\alpha$ -chloro- $\beta$ -, 267.  
 — —  $\alpha\beta$ -chloronitro- $\beta$ -, 266.  
 — — dichloranilido-, 149.  
 — —  $\alpha\beta$ -dichloro-, 149.  
 Naphthaquinonecarboxylic acid, dichloro-, 152.  
 Naphthaquinonedichlorodiimide, 614.  
 Naphtharesoreinol, chloronitroso-, 887.  
 — — hydrochloride, diamido-, 1198.  
 — — nitroso- and dinitroso-, 887.  
 Naphthilbenzil,  $\alpha$ -, 147.  
 Naphthionic acid, nitration of, 513.  
 Naphthoic acid,  $\alpha$ -, amido-, chloro-, nitro-, and imido-derivatives of, 152.  
 Naphthoic acid,  $\alpha$ -,  $\beta$ -chloro-, 514.  
 — — chloronitro-, [1 : 1' : 4'], 53.  
 — — dichloro-, 52.  
 — — nitro-, 52.  
 — — trichloro-, 52.  
 — — acids, 52, 152.  
 — — chloro- $\alpha$ -, [1 : 4'] and [1 : 1'], 52.  
 — — thermochemistry of, 1096.  
 — — trichloride,  $\beta$ -chloro-, 514.  
 Naphthol, amidothio-, 155.  
 — — dichloro- $\alpha$ -, 265.  
 Naphthol,  $\beta$ -, action of chlorine on, 265, 886.  
 — — action of halogens on, PROC., 71.  
 — —  $\alpha$ -amido-, identification of, TRANS., 120.  
 — — bromo-derivatives of, PROC., 71.  
 — — chloro-, PROC., 72.  
 — — chlorobromo-, PROC., 72.  
 — —  $\alpha\alpha$ -dichloro-, 266.  
 — —  $\alpha\beta$ -dichloro-, 266.  
 — — oxidation of, 1001.  
 — — sulphide, 404.  
 — — trichloro-, 267.  
 Naphtholactone, chloro- and nitro-, 153.  
 Naphtholbidiazobenzene,  $\alpha$ -, 152.  
 Naphthol- $\alpha$ -disulphonic acid,  $\beta$ -amido-, 273.  
 — — — [R-acid], constitution of, 515.  
 Naphthol- $\gamma$ -disulphonic acid, amido- $\beta$ -, 273.  
 Naphtholdisulphonic acids,  $\alpha$ -, 718.  
 Naphthols, action of iodine on, in alkaline solution, 1151.  
 — — chloro-, 150.  
 Naphtholsulphonic acid, diamido-, 515.  
 Naphtholsulphonic acid,  $\beta$ -, bromo- and chloro-derivatives of, PROC., 72.  
 Naphthol- $\alpha$ -sulphonic acid,  $\beta$ -, 275, 515, 714.  
 — — amido-, 271.  
 — — constitution of, 515, PROC., 8.  
 Naphthol- $\beta$ -sulphonic acid, amido- $\beta$ -, 272.  
 Naphthol- $\gamma$ -sulphonic acid, amido- $\beta$ -, 272.  
 Naphthol- $\delta$ -sulphonic acids, amido- $\beta$ -, 272.  
 Naphtholsulphonic acids,  $\alpha$ -, 717.  
 Naphtholsulphonic acids, isomeric,  $\alpha\alpha$ -, 157.  
 Naphtholtrisulphonic acid,  $\alpha$ -, 718.  
 Naphthostyryl, chloro-, 153.  
 — — derivatives of, 52, 53.  
 Naphthostyrylquinone, 53.  
 Naphthostyryltoluquinoxaline, 53.  
 Naphthosultones, 157.  
 Naphthotrichloride, chloro-, 615.



- Naphthoynaphthostyrils,  $\alpha$ - and  $\beta$ -, 53.  
 Naphthyl sulphides,  $\alpha$ - and  $\beta$ -, 715.  
 Naphthylamine,  $\alpha$ -, dichloro-, 265.  
 Naphthylamine,  $\beta$ -, products of the sulphonation of, 100, 105, TRANS., 35.  
 ——— the isomeric sulphonic acids of, TRANS., 33.  
 Naphthylaminebidiazobenzene,  $\alpha$ -, 152.  
 Naphthylaminedisulphonic acids,  $\beta$ -, 276.  
 Naphthylamine- $\alpha$ -sulphonic acid,  $\beta$ -, constitution of, 514, 718.  
 Naphthylaminesulphonic acid, Bronner's  $\beta$ -, acids formed by displacing  $\text{NH}_2$  in, by halogens, PROC., 74.  
 ——— action of fuming sulphuric acid on, 275.  
 Naphthylaminesulphonic acid, nitro-, 514.  
 ——— acids, isomeric,  $\alpha\alpha$ -, 156.  
 Naphthylaminesulphonic acid,  $\beta$ -, from  $\beta$ -naphtholsulphonic acids, TRANS., 37.  
 ——— properties of the four, TRANS., 36.  
 Naphthylcyanamide,  $\alpha$ -, 1165.  
 Naphthylenediamine, 1:1', 717.  
 ——— 2:2', preparation of, 893.  
 Naphthylenediamines, 1:2- and 1:4-, hydrogenation of, 892.  
 Naphthylenediamine- $\beta$ -sulphonic acid, ortho-, 274.  
 Naphthylenediamine- $\gamma$ -sulphonic acid, ortho-, 274.  
 Naphthylenediamine- $\delta$ -sulphonic acid, ortho-, 274.  
 Naphthylenediphenylcarbamide, 892.  
 Naphthylenediphenyldithiocarbamide, 892.  
 Naphthylglycine,  $\alpha$ -, 1015.  
 Naphthylglycinenaphthylamine,  $\beta$ -, 1199.  
 Naphthylglycines,  $\alpha$ - and  $\beta$ -, and their derivatives, 1199.  
 Naphthylhydroxythiocarbamide,  $\alpha$ -, 1165.  
 Naphthyllosazoneglyoxalcarboxylic acid,  $\alpha$ -, 238.  
 Naphthylpropionic acid,  $\alpha$ -, 1200.  
 Narceine meconate, 906.  
 Narcotine, 417.  
 Natrolite, analysis of, 219.  
 Nickel and cobalt salts. relative absorption of, by animal organs, 538.  
 ——— separation of, 1116.  
 ——— separation of, in the form of nitrites, 188.  
 ——— atomic weight of, 759.  
 ——— compound nature of, 349, 1114.  
 ——— estimation of, 678, 802.  
 ——— hydroxide, 1115.  
 ——— hypophosphate, 341.  
 ——— iron sulphide, 214.  
 Nickel ore, platiniferous, from Canada, 835.  
 ——— orthosilicate, 832.  
 ——— periodate, TRANS., 151.  
 ——— peroxide, 678.  
 ——— presence of another element in, 349, 1114.  
 ——— separation of from cobalt, 653, 747.  
 ——— separation of zinc from, 652.  
 ——— sodium hypophosphates, 341.  
 ——— subsulphide, 831.  
 ——— ultra-violet spectrum of, 89.  
 ——— volumetric estimation of, 747, 1033.  
 Nicotine acid tartrate, 730.  
 ——— specific rotatory and refractive powers of, 453.  
 Nile, fertilising properties of the water of, 646.  
 Nitramines and their preparation, 492.  
 Nitrates, absence of, in forest trees, 541.  
 ——— action of superphosphate on, 72.  
 ——— detection of, in soils, 547, 649.  
 ——— estimation of, by Kjeldahl's method, 308.  
 ——— estimation of, in natural waters, 312, 438.  
 ——— estimation of nitrogen in, by Kjeldahl's method, 547, 746.  
 ——— ethereal, correspondence between the magnetic rotation and the refraction and dispersion of light by, TRANS., 756.  
 ——— magnetic rotation of, TRANS., 682, 724.  
 ——— formation of deposits of, 680.  
 ——— formation of, in soils of different degrees of fertility, 70.  
 ——— in soils, source of error in the estimation of, 438.  
 ——— in the rain of tropical districts, 923.  
 ——— resorcinol as a test for, 75.  
 Nitration, 387.  
 Nitric acid, absence of, in wine-must, 541.  
 ——— amount of, in the rain-water at Rothamsted, TRANS., 537.  
 ——— and nitrous acid, formation of, by the evaporation of water in presence of soil and alkalis, 183.  
 ——— coefficient of diffusion of, 1047.  
 ——— conditions of action of, 1109.  
 ——— effect of carbamide on the activity of, 1109.  
 ——— estimation of, in rain-water, TRANS., 544.  
 ——— formation of, in the saliva, from formaldehyde and ammonia, 1228.

- Nitric acid, lecture experiments with, 672.  
 ——— magnetic rotatory power of, TRANS., 680, 724.  
 ——— anhydride, 341.  
 ——— oxide, decomposition of, in contact with water and potash, 15.  
 ——— mixtures of, with hydrogen, with methane, &c., action of the electric spark on, 15.  
 Nitrication of ammonia, 1239.  
 Nitriles, 254.  
 ——— aromatic, 596.  
 ——— di- and tri-molecular, 577.  
 ——— polymerides of, 577, 684.  
 Nitrites, action of, on blood pressure, 630.  
 ——— alkaline, preparation of, 825.  
 ——— ethereal magnetic rotation of, TRANS., 686, 727.  
 ——— presence of, in plants, 295.  
 ——— use of ammonium acetate in detecting, by Griess' reaction, 1243.  
 Nitro-compounds, connection between the magnetic rotation and the refraction and dispersion of light by, TRANS., 750.  
 ——— magnetic rotation of, TRANS., 687, 772.  
 ——— of alcohol radicles, action of alkalis on, 365.  
 ——— of the fatty series, 1140.  
 ——— primary and secondary, action of zinc ethyl on, 1127.  
 ——— secondary and tertiary, preparation of, from halogen-derivatives of nitromethane and nitroethane, 1128.  
 Nitrogen, absorption of, by clay soils, 1237.  
 ——— absorption of, by soils, 743.  
 ——— absorption of, in slow oxidation, 673.  
 ——— and hydrogen, simultaneous estimation of, 1031.  
 ——— atmospheric, absorption of by soils, 1238.  
 ——— and vegetable soils, 1237.  
 ——— behaviour of persulphuric acid towards, 941.  
 ——— calcium sulphite as a preventive of the loss of, in manure heaps, 184.  
 ——— comparative manurial value of the, in sodium nitrate and ammonium sulphate, 436.  
 ——— compounds, volatile, evolution of, from plants and vegetable soils, 1238.  
 ——— compressibility of, at very high pressures, 8.  
 ——— correspondence between the magnetic rotation and the refraction and dispersion of light by compounds containing, TRANS., 750.  
 Nitrogen, direct estimation of, in natural waters, 551.  
 ——— disengagement of, during putrefaction, 738, 739.  
 ——— estimation of, 307.  
 ——— estimation of, by Kjeldahl's method, 438, 546, 649, 925, 1088.  
 ——— in nitrates by Kjeldahl's method, 547, 746.  
 ——— in nitrate-superphosphate and Chili saltpetre, 185.  
 ——— in organic substances, 547.  
 ——— in vegetable soils, 307.  
 ——— gain of, by vegetation, 922.  
 ——— in sputum, 1076.  
 ——— influence of calcium sulphate and of clay on the absorption of, by soils, 1239.  
 ——— influence of electrification on the absorption of, by vegetable soils, 1237.  
 ——— loss and gain of, in agriculture, 71.  
 ——— loss and gain of, in soils, 745.  
 ——— loss of, in the decomposition of organic matter, 638.  
 ——— modification of Kjeldahl's method of estimating, 796.  
 ——— nitric, estimation of, by ferrous sulphate, 925.  
 ——— of the gramineæ and leguminosæ; 640.  
 ——— organic, estimation of, 746, 796; 1035.  
 ——— organic, estimation of, in natural waters by the Kjeldahl method, 796, 1035.  
 ——— oxides, combinations of, with metallic oxides, 834.  
 ——— source of error in the estimation of, by Kjeldahl's method, 649.  
 ——— source of error in the estimation of, in substances containing halogens, 546.  
 ——— total, in urine, estimation of, 649.  
 ——— true rôle of soda-lime in the estimation of, 306.  
 Nitrogen-compounds, magnetic rotation of, TRANS., 680.  
 Nitrogenous nuclei, nomenclature of compounds containing, 56.  
 Nitroltrimetaphosphoric acid, 211.  
 Nitrous acid and ammonia in potable water, 1234.  
 ——— formation of, in the saliva from formaldehyde and ammonia, 1228.  
 ——— anhydride, solidification of, 1109.  
 ——— preparation of, 569.  
 Nononaphthene, heat of combustion of, 6, 460.  
 Nuclein, 1021.

Nucleins, artificially prepared, 424.  
 Nutrition, influence of, on the composition of butter, 173.  
 — value of glycerol in, 736.

## O.

Oat crops, failure of, 742.  
 Oat grass, tall, analyses of, 1078, 1082.  
 Oats, composition and nutritive value of, 184.  
 — growth of, at Grignon, in 1884, 542.  
 Obsidian, solubility of, in sea water, 682.  
 Occlusion of gases by electrolytic copper, 946.  
 — of hydrogen, 206.  
 — of oxygen in pure silver, TRANS., 400.  
 Ochres, 678.  
 Octohydroethylstilbazole, 164.  
 Octylbenzyl cyanide, 862.  
 Octyloxybenzoin, 512.  
 Octylerythrol, 362.  
 Enanthaldehyde, action of unsymmetrical dialkylcarbamides on, 963.  
 Enanthylone, 235.  
 Oil, cod-liver, acid from, 170.  
 — detection of iron in, 448.  
 — earth-nut, 1058.  
 — ethereal, of white mustard, 1173.  
 — fatty, of *Cyperus esculentus*, 1029.  
 — fish-, distillation of, under pressure, 586.  
 — laurel-nut, 541.  
 — of anise, 659.  
 — of bitter almonds, detection of nitrobenzene in, 552.  
 — of *Daucus carota*, 277.  
 — of eucalyptus, spontaneous oxidation of, 616.  
 — of myrtle, 616.  
 — of sage, 1072.  
 — of sunflower, 956.  
 — of turpentine, spontaneous oxidation of, 615.  
 Oils, action of sulphur chloride on, 317.  
 — densities and refractive indices of, 85.  
 — drying, 956.  
 — essential, estimation of alcohol in, 445.  
 — — spontaneous oxidation of, 615.  
 — ethereal, colour reactions of, 802.  
 — fatty, action of warm air on, 1130.  
 — free fatty acids in, 799.  
 — mineral, safety of, 82.  
 — non-drying, 1058.  
 — reactions of, with silver nitrate, 1251.

Oils, specific gravities of, 801.  
 — vegetable fatty, adulteration of, 316.  
 Oleic acid, boiling points of, 691.  
 — — conversion of, into stearic acid, 1140.  
 — — falsification of, by linoleic acid, 799.  
 Oleo-gum-resin secreted by *Araucarias*, 1236.  
 Oleum *Myrcia acris*, 1072.  
 Olibene from frankincense, 1072.  
 Oligoclase, transparent, remarkable variety of, 24.  
 Olive oil, 374.  
 — — density and refractive index of, 86.  
 — — detection of cotton-seed oil in, 658.  
 Optically active substances, crystalline form of, 1041.  
 Ore deposit of Badenweiler, 27.  
 Organic analysis, modifications in the methods of, 190.  
 — — wet methods of, 80.  
 — compounds, action of nitric acid on, 1143.  
 — — action of sunlight on, 405.  
 — — detection of bromine, chlorine, iodine, and sulphur in, 796.  
 — — influence of certain groups on the behaviour of nitric acid with, 1145.  
 — — relationships between the composition and absorption-spectra of, 1093.  
 — matter, loss of nitrogen during the decomposition of, 638.  
 — substances, estimation of nitrogen and phosphoric acid in, 547.  
 — — slow combustion of, 639.  
 Organism, animal, influence of carbohydrates on, 1028.  
 — — synthetical processes in the, 174.  
 — behaviour of sulphur in the, 432.  
 — combustion in, 937.  
 — fate of certain ferments in, 178.  
 Orthoclase, ferric, 357.  
 — solubility of, in sea water, 682.  
 Osmotic pressure, molecular weight determinations from, 820.  
 — — reduction of the freezing point and electrical conductivity, relation between, 668.  
 Oxalaldehyde-*aww*-methylphenylhydrazonediaxime, meso-, 48.  
 Oxalbutylbutylene, 119.  
 Oxal- $\psi$ -cumidic acid, 140.  
 Oxal- $\psi$ -cumidide, 140.  
 Oxaleneanilidoximeamidoxime, 1142.  
 Oxalenediamidoxime, 1142, 1163.

Oxalethylbutyline, 119.  
 Oxalic acid, amidoxime of, 1142.  
 ——— coefficient of diffusion of, 1047.  
 ——— specific heat of, 93, 94.  
 ——— thermochemistry of, 1097.  
 ——— nitrile, heats of combustion and formation of, 812.  
 Oxalisoamylbutylamine, 119.  
 Oxalisoamylisobutyline, 120.  
 Oxalisobutylbutyline, 119.  
 Oxalmethylbutyline, 119.  
 Oxalmethylisobutyline, 120.  
 Oxalomolybdic acid, 858.  
 Oxalorthotoluidide, 139.  
 Oxalotoluidide, nitro-derivatives of, 771.  
 Oxalpropylbutyline, 119.  
 Oxalpropylisobutyline, 120.  
 Oxalxylidic acid, 140.  
 Oxalxylidide, 140.  
 Oxamic acid, 962, 1142.  
 Oxanilic acid, 707.  
 Oxanilidiodiorthocarboxylic acid, 139.  
 Oxazine-series, syntheses in the, 1217.  
 Oxidation experiments with the galvanic current, 926.  
 ——— in animals, influence of light on, 172.  
 ——— in the living cell, 1028.  
 ——— primary and secondary, in the organism, 172.  
 ——— slow, absorption of nitrogen during, 673.  
 Oximes, behaviour of, with mordants, 868.  
 ——— preparation of, 689.  
 Oximido-compounds, isomerism of, 607, 608, 609.  
 Oxyamidosulphonates and their conversion into hyponitrites, TRANS., 760.  
 ——— decomposition of, by alkaline bases, TRANS., 765.  
 ——— oxidation of, by basic reagents, TRANS., 770.  
 Oxyamidosulphonic acid, hydrolysis of, TRANS., 764.  
 ——— preparation of, TRANS., 761.  
 Oxyethenyldiamidotoluene, 866.  
 Oxygen, absorption-spectrum of, 1.  
 ——— and ammonia, eudiometric investigation with mixtures of, 1031.  
 ——— atomic weight of, 672, 935.  
 ——— combustion of organic substances in, at high pressure, 929.  
 ——— compressibility of, at very high pressures, 8.  
 ——— direct estimation of, in natural waters, 551.  
 ——— dissolved in water, estimation of, 79, TRANS., 552.  
 ——— dried, combustion in, 465.  
 ——— evidence of the quantivalence of, 404.

Oxygen, moist, action of light on, PROC., 134.  
 ——— occlusion of, in pure silver, TRANS., 400.  
 ——— preparation of, 465.  
 ——— solubility of, in water, 936.  
 Oxyhæmoglobin, detection of methæmoglobin in presence of, 660.  
 ——— in the bile, 636.  
 ——— influence of temperature on the tension of dissociation of, 630.  
 ——— reducing action of indigo-white on, 530.  
 ——— reduction of, in the heart, 1225.  
 Oxyhydrastinine, 627.  
 ——— constitution of, 1222.  
 Oxyhydrogen gas, catalytic action of metals on, 206.  
 Oxylepidenic acid, PROC., 139.  
 Oxylepidens, PROC., 137, 138.  
 Oxymethylene, 369.  
 Oxsapogenin, 1004.  
 Oxythiazoles, conversion of ketone thiocyanates into, 413.  
 ——— reduction of, to thiazoles, 413.  
 Ozone, action of, on guaiacum resin, 900.  
 ——— determination of the boiling point of, 821.

## P.

Palæopierite from Stoppenberg, in the Harz, 673.  
 Palladium, absorption of hydrogen by, 568.  
 ——— non-magnetisable alloys of, for watch works, 573.  
 Palmitonitrile, conversion of, into hexadecylamine, 688.  
 Papaveraceæ, alkaloids from, 62.  
 Papaverine, additive product of, with orthonitrobenzyl chloride, 281.  
 ——— bases formed by the action of potash on additive products of, 166.  
 ——— constitution of, 167.  
 ——— methiodide, 416.  
 ——— phenacyl bromide, 418.  
 ——— oxide, 419.  
 ——— salts, 419.  
 Papaverine-derivatives, 166.  
 Papaveronic acid, 1016.  
 Paraffin, estimation of, 83.  
 ——— solubility of, in various solvents, 82.  
 Paraformaldehyde, molecular weight of, 369.  
 Paragonite from the Zillerthal, Tyrol, 23.  
 Paraisobutaldehyde, action of sulphur on, 120.  
 Paraldehyde, action of ethyl iodide and zinc on, 954, 1136.  
 ——— influence of, on digestion, 533.

- Paraxanthine, physiological action of, 293.  
 Passivity of cobalt, 1114.  
 Pasture, permanent, seeds for, 1084.  
 Pea-nut oil, density and refractive index of, 86.  
 Pearls, composition of, 179.  
 Peas, fat from, 296.  
 Pentabenzoyldextrose, 1152.  
 — action of phenylhydrazine on, 1130.  
 Pentabenzoylgalactose, 1153.  
 Pentabenzoylmaltose, 1153.  
 Pentabenzoylmannitol, 1152.  
 Pentacetylcellulose, *Proc.*, 133.  
 Pentacetyldextrose, 952, 1131.  
 Pentacetylalactose, 1131.  
 Pentadecyldiphenyl tricyanide, 697.  
 Pentamethylbenzamide, 876.  
 Pentamethylbenzene, heats of combustion and formation of, 1042.  
 Pentamethylbenzoic acid, 876.  
 Pentamethylene bromide, 950.  
 — glycol, 950.  
 Pentamethylenediamine, 950.  
 — in cystinuria, 1024.  
 — magnetic rotatory power of, *TRANS.*, 698, 732.  
 Pentamethylenedinitramine, 492.  
 Pentamethylphenylglyoxylic acid, 875.  
 Pentamethylphloroglucinol, 497.  
 Pentane, nitro-, primary, action of zinc ethyl on, 1127.  
 Pentathionates, action of alkalis on, 823.  
 Pentene, pentamido-, 769.  
 Pentenylglycerol, 231.  
 Pentethylbenzene and its derivatives, 40.  
 — decomposition of, by sulphuric acid, 40.  
 Pentethylbenzenesulphone, 40.  
 Pentethylbenzenesulphonic acid, salts of, 40.  
 Pentic acid, molecular weight of, 489.  
 Pentone, tetrathio-, 852.  
 Pertylamine and its derivatives, 976.  
 Pentyldole, 3', 260.  
 Pepper, test for the addition of ground olive stones to, 88.  
 — volatile alkaloid in, 298.  
 Pepsin in normal and pathological urine, 430.  
 Peptone blood, gases of, 531.  
 Peptones, commercial, examination of, 803.  
 Perhydrides of the higher aromatic hydrocarbons, 719.  
 Periclast from Normarken, 216.  
 Periodates, *TRANS.*, 148.  
 — constitution of, *TRANS.*, 152.  
 Periodic law, experimental researches on, *TRANS.*, 382.  
 — — mechanical properties of metals in relation to, 105.  
 Periodic law, of the chemical elements, *TRANS.*, 634.  
 Peridotite of Elliott Co., Kentucky, 680.  
 — of Iron Mine Hill, Cumberland, Rhode Island, 27.  
 Peroxides, constitution of, 939.  
 — electro-motive force of thin layers of, 661.  
 Perseitol, 32.  
 — dibenzoic acetal of, 32.  
 Perstannic anhydride, 1051.  
 Persulphuric acid, behaviour of, towards nitrogen, 941.  
 — — electrical behaviour of platinum in, 1041.  
 — — formation of hydrogen peroxide from, 940.  
 — — galvanic polarisation in the formation of, 1041.  
 Perthiocyanic acid, normal, 228.  
 Perthiocyanoglycollic acid, 229.  
 Peru balsam, testing, 196.  
 Petroleum, Burnese, 949.  
 — (kerosene) oils, commercial, safety of, 82.  
 — natural, mineral matter in, 226.  
*Phalaris arundinacea*, analyses of, 1078-1082.  
 — *canariensis*, composition of the seeds of, 794.  
 Phenacetin, detection of antifebrin in, 660.  
 Phenacite from Colorado, 356.  
 — from Maine, 24.  
 Phenacylethylacetic acid, 257.  
 Phenacylethylmalonic acid, 257.  
 Phenallyldihydrothiometadiazine, 973.  
 Phenanthrapiazine, *TRANS.*, 98.  
 — dihydride, *TRANS.*, 98.  
 Phenanthraquinone, action of acetamide on, *TRANS.*, 107.  
 — action of aldehydes on, under the influence of sunlight, 405.  
 Phenanthraquinonedioxime, 1202.  
 Phenanthraquinoneoximes, 1067, 1201.  
 Phenanthrene, heats of combustion and formation of, 1042.  
 — perhydride, 720.  
 Phenanthroisobutylbenzene, 44.  
 Phenanthroisobutylphenazine, 44.  
 Phenanthrolinecarboxylic acid, 521.  
 Phenazine, amido-, and diamido-, 500.  
 Phenidihydroketometadiazine, 972.  
 Phenomorpholine, 1220.  
 Phenol, action of iodine on, in alkaline solution, 1150.  
 — action of the chlorides of propionyl and butyryl on, *TRANS.*, 546.  
 — chlorobromoparanitro-, metallic derivatives of, *TRANS.*, 57, 58.  
 — dibromorthonitro-, calcium-derivative of, *TRANS.*, 61.

- Phenol, dichlororthonitro-, action of chlorine on, TRANS., 586.  
 ——— calcium-derivative of, TRANS., 61.  
 ——— direct preparation of from benzene, 241.  
 ——— homologues of, conversion of, into primary and secondary amines, 700.  
 ——— nitro-, isomeric with  $\alpha$ -nitro-camphor, 618.  
 ——— orthamido-, action of chlorine on, 599.  
 ——— ——— and paramido, action of acetone on, 524.  
 ——— orthochloroparabromo-, nitration of, TRANS., 584.  
 ——— orthochloroparabromorthonitro-, action of bromine on, TRANS., 585.  
 ——— ——— action of nitric acid on, TRANS., 584.  
 ——— orthochloroparanitro-, bromination of, TRANS., 56.  
 ——— orthonitro-, action of chlorine on, TRANS., 586.  
 ——— paramido-, oxidation of, 973.  
 ——— parabromorhiodorthonitro-, calcium-derivative of, TRANS., 61.  
 ——— parabromorhiodorthonitro-, nitration of, TRANS., 590.  
 ——— parabromorthonitro-, action of chlorine on, TRANS., 586.  
 ——— parachlororhobromorthonitro-, action of nitric acid on, TRANS., 584.  
 ——— ——— calcium-derivative of, TRANS., 60.  
 ——— ——— nitration of, TRANS., 589.  
 ——— parachlororthonitro-, action of bromine on, TRANS., 588.  
 ——— paradichloroparanitro-, 244.  
 ——— perchlorination of, 1149.  
 ——— products of the action of chlorine on, in alkaline solution, 853,  
 ——— series, isomeric changes in, TRANS., 583.  
 Phenoldisulphonic acid, 1185.  
 Phenolphthaleïn, behaviour of, with ammonia, 746.  
 Phenols, action of chlorine on, 265.  
 ——— behaviour of, towards the alkali hydrosulphides, 496.  
 ——— benzoyl-compounds of, 1152.  
 ——— desmotropy in, 247, 966.  
 ——— halogen-nitro-, some metallic derivatives of, TRANS., 56.  
 ——— iodated, new class of, 1150.  
 ——— iodation of, in ammoniacal solution, 697.  
 ——— polyhydric, action of borax on, 864.  
 Phenolsulphonic acid, bromortho-, 1184.  
 ——— ——— iodo-, 1184.  
 ——— ——— ortho-,  
 ——— acids, iodo-, 993.  
 Phenuvic acid, 595.  
 Phenyl acetate, action of chlorine and bromine on, 599.  
 ——— butyrate, TRANS., 547.  
 ——— cyanate, action of hydroxylamine on, 1164.  
 ——— cyanide, dispersive power of, 8'5.  
 ——— ethers, alkylene-derivatives of, 862.  
 ——— naphthyl carbinol,  $\alpha$ -, 781.  
 ——— propionate, TRANS., 546.  
 ——— selenide, 41, 1167.  
 ——— thiocyanate, diamido-, 700.  
 Phenylacetic acid, derivatives of, 506.  
 ——— ——— thermochemistry of, 1096.  
 Phenylacetodiethylamide, 506.  
 Phenylacetodiphenylamide, 506.  
 Phenylacetonylphenyl sulphide, 489.  
 Phenylacetylegonine, 283.  
 Phenylacetylene, reduction of, 878.  
 Phenylacetylenebenzoylactic acid, 148.  
 Phenylacrylic acid,  $\beta$ -, thermochemistry of, 1096.  
 Phenylallylene and its di- and tetrabromide, 372.  
 Phenylamidoacetic acid, indole from, 1068.  
 Phenylamidodimethylpyrroline, 386.  
 Phenylamidolactic acid, 988.  
 Phenylamidomethyl-diethylmetadiazine, 685.  
 Phenylamidonaphthylcarbamide, 892.  
 Phenylanisacrylonitrile,  $\alpha$ -, 598.  
 Phenylaspartanil, 124.  
 Phenylaspartic acid, derivatives of, 1064.  
 Phenylazonitrosoresorcinol, 137.  
 Phenylazoresorcinyll ethers, conversion of, into hydroxyquinol-derivative, 1155.  
 ——— methyl ether, para-, 1155.  
 ——— nitroso-, 137.  
 Phenylazoresorcinyll dimethyl ether, 1155.  
 ——— ——— ——— ortho-, 1155.  
 Phenylazo- $\alpha$ -tetrahydronaphthylamine, 715.  
 Phenylbenzidine, diorthonitro-, 773.  
 Phenylbenzopyrazolecarboxylic acid, nitro-, 516.  
 Phenylbenzoxycarbamide, 1165.  
 Phenylbenzoxothiocabamide, 1165.  
 Phenylbenzylthiocarbamide, TRANS., 300.  
 Phenylbromethylactic acid, paranitro-, lactone of, 397.  
 Phenyl- $\beta$ -bromopropylene, 372.  
 Phenylbutinecarboxylic acid, paranitro-, 396.  
 Phenylbutinedicarboxylic acid, paranitro-, 396.  
 Phenylcinnamonitrile,  $\alpha$ -, 597.

- Phenylcyanethine, 685.  
 Phenylacetate, 1171.  
 Phenyldiamidometaxylylmethane, meta- and paranitro-, 134.  
 Phenyl diazo resorcinols, isomeric, 138.  
 Phenyl dibenzylmetadiazine, amido-, 684.  
 Phenyl dibromomethyl bromacrylic acid, paranitro-, 396.  
 Phenyl- $\alpha$ - $\beta$ -dibromisobutyric acid, derivatives of, 372.  
 Phenyl dihydrodibromobutinecarboxylic acid, paranitro-, 396.  
 Phenyl- $\alpha$ - $\beta$ -diketobutane,  $\omega$ -, 1171.  
 Phenyl- $\alpha$ - $\omega$ -diketobutane,  $\omega$ -, 1171.  
 Phenyl- $\alpha$ - $\delta$ -diketopiperazine, 1115.  
 Phenyl- $\alpha$ - $\omega$ -diketopropane,  $\omega$ -, 1170.  
 Phenyl dimethylhydroxypyrimidine, 1008.  
 Phenyl dimethylpyrazolone, 518.  
 Phenyl dimethylpyrazolonetartronylcarbamide, 517.  
 Phenyl dimethylpyrazolonetartronylimide, 517.  
 Phenyl diparamidophenylisobutylmethane, meta- and para-nitro-, 133.  
 Phenyl diparamidotolylmethane, met-amido, 133.  
 —  $\alpha$ - and  $\beta$ -metanitro-, 133.  
 Phenyl enecarbamide, amido-, 46.  
 Phenyl enediamine, meta- and para-, physiological action of, 66.  
 — ortho-, oxidation of, 499.  
 — para-, oxidation of, 973.  
 Phenyl enediamine parasulphonic acid, ortho-, 881.  
 Phenyl enediamines, benzyl-derivatives of, TRANS., 590.  
 — thermochemistry of, 1099.  
 Phenyl enediaminesulphonic acid, ortho-, 144.  
 Phenyl enediaminethiosulphonic acid, para-, 777.  
 Phenyl enediazosulphide, ortho-, 135.  
 Phenyl enediazosulphidecarboxylic acid, 868.  
 Phenylethoxythiocarbamide, 1165.  
 Phenylethylamine-derivatives, 976.  
 Phenylethylthiophen [2 : 4], 258.  
 Phenylfurfuracrylonitrile,  $\alpha$ -, 598.  
 Phenylglycine, preparation of, 1013.  
 Phenylglycinorthocarboxylic acid, 143.  
 Phenylglyoxime, 610.  
 Phenylglyoxylic acid, derivatives of, 506.  
 Phenylhydantoic amide, 706.  
 Phenylhydrazine, action of carbonyl chloride on, 1165.  
 — action of carbonyl sulphide on, 1164.  
 — action of ethyl chlorocarbonate on, 1165.  
 Phenylhydrazine action of nitroso-bases on, 702.  
 — action of, on phloroglucinol and resorcinol, 1162.  
 — action of, on tetrachloroacetone, 1160.  
 — derivatives of, 392.  
 — halogen-derivatives of, 251.  
 — inorganic derivatives of, 1163.  
 — orthamido-, 501.  
 — orthonitro-, 501.  
 — reactions of, 1163.  
 Phenylhydrazine parasulphonic acid, orthamido- and orthonitro-, 144.  
 Phenylhydrazines, unsymmetrical secondary, preparation of, 1158.  
 Phenylhydrazones, 251.  
 Phenyl- $\alpha$ -hydroxy- $\beta$ -bromisobutyric acid, 372.  
 Phenylhydroxypyrimidinecarboxylamide, 1009.  
 Phenylhydroxypyrimidinecarboxylic acid, 1009.  
 Phenyl- $\mu$ -hydroxythiazole,  $\alpha$ -, 413.  
 Phenylhydroxythiocarbamide, 1164, 1165.  
 Phenylimidazole, 624.  
 Phenylimidazolylmercaptide, 624.  
 Phenylimidodiacetic acid, 1013.  
 — anilide and dianilide, 1014.  
 Phenylindoles, formation of, by isomeric change, PROC., 90.  
 Phenylisindazolecarboxylic acid, nitro-, 517.  
 Phenylisocrotonic acid, orthoparadi-chloro-, 265.  
 Phenylketopentene, 595.  
 Phenylmetatolylcarbamide, 702.  
 Phenylmethoxythiocarbamide, 1165.  
 Phenyl- $\mu$ -methylamidothiazole,  $\alpha$ -, 415.  
 Phenylmethylbenzylhydroxypyrimidine, 1008.  
 Phenyl- $\alpha$ -methyl- $\beta$ -bromacrylic acid, 372.  
 Phenylmethylethylhydroxypyrimidine, 1008.  
 Phenylmethylhydroxypyrimidine, 1008.  
 Phenylmethyl- $\mu$ -imidothiazoline,  $\alpha$ -, 415.  
 Phenylmethylmethoxypyrazolone, 518.  
 Phenylmethylmethylenepyrazolone, 518.  
 Phenylmethylnitramine, tetranitro-, and its conversion into metaphenylenediamine-derivatives, 1154.  
 — trinitro- 971.  
 Phenylmethylpyrazole [1 : 5], 410.  
 Phenylmethylpyrazolodicarboxylic acid [1 : 5 : 3 : 4], 410.  
 Phenylmethylpyrazolone carbinol, 518.  
 Phenylmethylpyrazolonemalonylcarbamide, 518.  
 Phenylmethylpyrrolidonecarbonitrile, 1211.

- Phenylmethylpyrrolidonecarboxylic acid, 1212.
- Phenyl- $\alpha$ -methylselenazole,  $\mu$ -, 727.
- Phenylmethyltriazenylamidoxime-derivatives, 977.
- Phenylmethyltriazenylbenzenylazoxime, 978.
- Phenylmethyltriazenylethenylazoxime, 978.
- Phenylmorpholine, 1219.
- Phenyl- $\alpha$ -naphthacinchonic acid,  $\alpha$ -, 411.
- Phenyl- $\beta$ -naphthacinchonic acid,  $\alpha$ -, 412.
- Phenyl-naphthalene,  $\beta$ -, PROC., 70.
- Phenyl- $\alpha$ -naphthaquinoline,  $\alpha$ -, 411.
- Phenyl- $\beta$ -naphthaquinoline,  $\alpha$ -, 412.
- Phenyl-naphthylglycollic acid,  $\alpha$ -, 781.
- Phenylorthomethoxycinchonic acid,  $\alpha$ -, 411.
- Phenylorthomethoxyquinoline,  $\alpha$ -, 411.
- Phenylsazoneglyoxalcarboxylic acid, 237.
- Phenylparaconic acid, ortho-, para-, and meta-chloro-, 150.
- — orthoparadichloro, 265.
- acids, isomeric chloro-, disubstituted naphthalenes from, 150.
- Phenylparamethoxyquinoline,  $\alpha$ -, 411.
- Phenyl-phenylhydrazine, orthoparadinitro-, 1160.
- Phenylpiperidylactic acid, 988.
- Phenylpropionic acid, direct addition of hydrogen to, 878.
- Phenylpropionic acid,  $\beta$ -, thermochemistry of, 1096.
- Phenylpropylamine, and its derivatives, 976.
- Phenylpyrazole, 1215.
- [1], 410.
- Phenylpyrazolecarboxylic acid [1 : ?], 410.
- Phenylpyrazoletricarboxylic acid [1 : 3 : 4 : 5], 410.
- Phenylpyrazoline, 1215.
- Phenylpyridinephenyleneketonecarboxylic acid,  $\alpha$ -, 412.
- Phenylpyridinesulphodicarboxylic acid,  $\beta$ -, 527.
- Phenylpyruvic acid, synthesis of, 990.
- Phenylquinimic acid,  $\alpha$ -, 411.
- Phenylselenazylamine,  $\alpha$ -, 726.
- Phenyltetrahydro- $\beta$ -naphthabenzylcarbamide, 1198.
- Phenyltetrahydro- $\beta$ -naphthabenzylthiocarbamide, 1198.
- Phenyltetrazenylamidoxime, 979.
- Phenylthiazole, 414.
- Phenylthiazole,  $\alpha$ -, 725.
- Phenylthiazylamine, 415.
- Phenylthiocarbamide, action of chlorosulphonic acid on, 1165.
- Phenylthiocarbamide, action of hydrogen peroxide on, 872.
- action of thialdine on, TRANS., 627.
- Phenyltrimethyleneimine, 252.
- Phenylvinylhydroxypropionic acid, paranitro-, 397.
- Phenylthronic acid, 595.
- Phlebin, 787.
- Phloroglucinol, action of chlorine on, 967.
- action of methyl iodide and potash on, 497.
- action of phenylhydrazine on, 1162.
- trichloro-, 967.
- Phloroglucinotannic acid, 1063.
- Phlorotannin-red, 1063.
- Phosphate of Beauval, origin of, 837.
- Phosphates and cereals, 1242.
- insoluble, estimation of, 747.
- manuring cereals with, 435.
- natural, estimation of fluorine in, 74.
- of polyvalent metals, 756.
- Phosphatic deposits of Montay and Forest, 222.
- Phosphodecamolybdic acid, 760.
- Phosphorescence of alumina, TRANS., 280.
- Phosphoric acid, direct estimation of, as tricalcium phosphate, 439.
- — estimation of, 186, 308.
- — estimation of, in basic slag, 439.
- — estimation of, in organic substances, 547.
- — estimation of, in sweet wines, 547.
- — estimation of, in the presence of ammonium citrate, 548.
- — estimation of, with silver nitrate, 307.
- — estimations, calculation of, 439.
- — of basic slag, assimilation of, 647.
- — of mineral origin, detection of, 1032.
- — titration of, with molybdate, and gravimetric estimation of, 762.
- Phosphorous acid, 825.
- — constitution of, 103.
- Phosphorus, amides of, 210.
- combustion of, in dried oxygen, 465.
- dissemination of, in masses of metal, 13.
- estimation of, in iron, 76, 648, 1244.
- estimation of, in iron and steel, 76.



- Phosphorus, estimation of, in iron in presence of silicon, 1244.  
 — estimation of, in iron ores, 189.  
 — estimation of, in organic compounds, 81.  
 — in the Ludington Mine, Michigan, 763.  
 — vapour-density of, 673.  
 Phosphorus-trianhydropyruvic acid, 36.  
 Phosphorus-trihydropyruvic acid dianilide, 36.  
 — hydrazide, 36.  
 Phosphoryl trifluoride, preparation of, TRANS., 759.  
 Phototungstic acid, 469, 1121.  
 Photochemical decomposition of chlorine-water, action of hydrogen chloride and metallic chlorides on, 1093.  
 Phthalic acid, specific heat of, 93, 94.  
 — thermochemistry of, 1096.  
 — anhydride, thermochemistry of, 1096.  
 — chloride, action of zinc ethyl and zinc methyl on, 1059.  
 Phthalimide, dibromo-, 257.  
 Phthalimidine, 253.  
 — and its derivatives, 140.  
 Phthalimidines, substituted, 141.  
 Phthalylethanethine, 685.  
 Phthalyldecgonine, 283.  
 Phycoerythrin, isomeric modifications of, 623.  
 Phyllotaonin, 279.  
 Physiological action and chemical constitution of certain sulphones, relation between, 1232.  
 — of acetophenone, 1076.  
 — of amyl nitrite, 433.  
 — of antharobin and chrysarobin, 539.  
 — of hydrocyanic acid, 1232.  
 — of nickel and cobalt salts, 538.  
 — of para- and meta-phenylenediamine, 66.  
 — of paraxanthine, 293.  
 — of the tetrahydronaphthylamine-compounds, 737.  
 — of uranium salts, 537.  
 Physiology, chemical, applications of spectrophotometry to, 73.  
 Piaselenoles, 785.  
 Piazine-derivatives, TRANS., 97.  
 Picene icosihydride, 720.  
 — perhydride, 720.  
 Piemontite, occurrence of, 25.  
 Pigment black, of the choroïd, 788.  
 — yellow, in butterflies, PROC., 117.  
 Pigments, blue, absorption-spectra of, 325.  
 — muscle-, 633, 1231.  
 — of the urine, 531.  
 Pig's bile, a crystalline acid from, 1231.  
 — acids of, 422.  
 Pimelic acid, boiling points of, 691.  
 — thermochemistry of, 1097.  
 Pine-wood resin, a delicate reaction for, 660.  
 Pinene, action of chromium oxychloride on, TRANS., 45.  
 Pinenitrolbenzylamine, 1071.  
 Pipecoline,  $\alpha$ -, oxidation of, 904.  
*Piper beetle*, oil of, 863.  
 Piperazines, 1009.  
 — characteristics of, 1015.  
 Piperidine, 901.  
 Piperidine hydrochloride, magnetic rotatory power of, TRANS., 716.  
 — magnetic rotatory power of, TRANS., 699, 733, 736.  
 — nitro-, 1145.  
 —  $\gamma$ -truxilopiperidate, 1213.  
 Piperidylbenzoylthiocarbamide, TRANS., 623.  
 Piperno of the Collina del Vomero, 222.  
 Piperonalphenylhydrazone, 252.  
 Piperylcarbamide, 1145.  
*Plantago psyllium*, sugar obtained from, 233.  
 Plant ashes, determination of chlorine in,  
 — respiration, transformation of force and material in, 540.  
 Plants, action of water containing sodium chloride on, 795.  
 — blood pigment as a gauge of gaseous exchange in, 182.  
 — boric acid as a constituent of, 794.  
 — damage done to, by acid vapours, 795.  
 — etiolated, protophyllin in, 1236.  
 — evolution of ammonia and volatile nitrogen-compounds from, 1238.  
 — green, kept in the dark, decomposition of proteïds in, 642.  
 — lecithin in the seeds of, 645.  
 — presence of nitrites in, 295.  
 — products of the decomposition of albuminoids in, 642.  
 — relation between the intensity of radiation and the decomposition of carbonic anhydride by, 1234.  
 — rôle of formaldehyde in the assimilation of, 640.  
 — solid hydrocarbons in, 68.  
 — variations of the internal atmosphere of, 641.  
 Platinates of the alkalis and alkaline earths, 1125.  
 Platinethylsulphine salts, 230.  
 Platinibenzylsulphine chloride, 369.

- Platinibutylsulphine chloride, 368.  
 Platiniferous nickel ore from Canada, 835.  
 Platinimethylsulphine salts, 230.  
 Platinipropylsulphine salts, 368.  
 Platinisobutylsulphine salts, 369.  
 Platinisopropylsulphine iodide, 368.  
 Platinum, action of silicon on, 1125.  
 — alloys of, certain generic electrical relations of, 201.  
 — chloride, normal, 20.  
 — incandescent, action of, on gases and vapours, 208.  
 — native. from Canada, 109.  
 — tetrachloride, 834.  
 — wire, incandescent, action of on gases and vapours, 20.  
 Platosobenzylsulphine salts, 369.  
 Platosobutylsulphine salts, 368.  
 Platosodiethylenediamine chloride, 352.  
 Platosoethylenediamine-amine, chloride, 352.  
 Platosoethylmethylsulphine chloride, 230.  
 Platosoethylpropylsulphine chloride, 230.  
 — iodide, 368.  
 Platosoethylsulphine salts, 230.  
 Platosoisobutylsulphine salts, 368.  
 Platosoisopropylsulphine salts, 368.  
 Platosomethyldisulphine salts, 229.  
 Platosomethylsulphine salts, 229.  
 Platosopropylisopropylsulphine iodide, 368.  
 Platosopropylsulphine salts, 367, 368.  
 Platososemiediethylenediamine chloride, 351.  
 Plumboaragonite from Leadhills, TRANS., 95.  
 Plumbocalcite from Leadhills, TRANS., 95.  
 Plutonic and metamorphic rocks at Omeo, 222.  
*Poa pratensis*, analyses of, 1078—1082.  
 Poisoning by expired air, 629.  
 — carbonic oxide, new test for, in blood, 650.  
 — — — new test for the blood in, 88.  
 — cases, destruction of organic matter in, 653.  
 Polyketones, passivity of certain, to hydroxylamine and phenylhydrazine, 254.  
 Polymeric compounds, determination of the molecular weights of, by Raoult's method, 1105.  
 Polymerism and isomerism, use of Raoult's method to distinguish between, 754.  
 Porcelain glazes, 214.  
 Porphyrites of Gabian, 110.  
 Potash, absorptive power of sea sludge for, 1241.  
 — arsenic in, 341.  
 — coefficient of diffusion of, 1047.  
 — heat of neutralisation of, 811.  
 Potassiovanadyl fluorides, 1123.  
 Potassium acetate, fused, electrolysis of, 1056.  
 — ammonium sulphite, 1106.  
 — antimonate, electrolysis of, with carbon electrodes, 559.  
 — antimony oxalate, 489.  
 — boiling point of, TRANS., 326.  
 — bromacetate, electrolysis of, 1056.  
 — chloracetate, electrolysis of, 1056.  
 — chlorate, decomposition of, by heat in the presence of manganese peroxide, TRANS., 184.  
 — — decomposition of, in contact with metallic oxides, 343.  
 — chromates, 1119.  
 — effect of, on the freezing point of sodium, TRANS., 674.  
 — hydrogen fluoride, preparation of, TRANS., 166.  
 — hydroxide, vapour-tensions of solutions of, 205.  
 — iodide and ferric chloride, reaction between, 1113.  
 — iodoxydiiodoresorcinol, 1151.  
 — iron cyanogen-compound, new, 359.  
 — — sulphide, action of cuprous chloride on, 354.  
 — — thiocyanates, 1129.  
 — lowering of the freezing point of, by the addition of other metals, TRANS., 676.  
 — manganate, use of, in analysis, 798.  
 — molecular weight of, TRANS., 530, 533.  
 — periodate, TRANS., 151.  
 — platinocyanide, derivatives of, 951.  
 — polysulphides, constitution of, 1110.  
 — salts, organic, electrolysis of solutions of, 1056.  
 — sodium sulphite, 942, 1106.  
 — — thiosulphate, 943.  
 — sulphites, 1106.  
 Potatoes, cultivation of, 647.  
 Potential, contact, of a metal and its salt, 661.  
 — difference and striking distance, relation between, in various gases, 806.  
 — minimum point and change of, of a voltaic couple, 200.  
 Prehnitenedicarboxylic acid, 874.  
 Primuline base, TRANS., 233.  
 — — action of potash on, 868.

- Primuline base, constitution of, TRANS., 234.  
 — constitution of, 867, TRANS., 227.  
 — history of, 868.  
 — nature of, 602.  
 Propane, hexachloro-, 1136.  
 — nitro, action of alcoholic potash on, 365.  
 — — action of zinc ethyl on, 1127.  
 — — magnetic rotatory power of, TRANS., 688, 727.  
 — trinitroso-, 34.  
 Propionamide, 381.  
 Propione, 235.  
 Propionic acid,  $\alpha$ -bromo-, electrolysis of, 1056.  
 Propionitrile, heats of combustion and formation of, 812.  
 — magnetic rotatory power of, TRANS., 701.  
 — synthesis of ketonic acids by the action of acid chlorides on, 957.  
 Propionylbenzoyl, 1171.  
 Propionylethyl cyanide,  $\alpha$ -, 114.  
 — —  $\alpha$ -imido-, 114.  
 Propionylphenol, TRANS., 547.  
 Propionylpropionamide,  $\alpha$ -, 957.  
 Propiophenone, isonitroso-, and its derivatives, 613.  
 — nitroso-, 585.  
 Propoxylbenzoic acid, para-, 975.  
 Propyl alcohol and water, vapour-pressures of a mixture of, PROC., 1888, 101.  
 — cocaylbenzoylhydroxacetate, 420.  
 — cyanide, dimolecular, 684.  
 — fluoride, 575.  
 — methyl ketone, bromo-, 844.  
 — nitrate, magnetic rotatory power of, TRANS., 683.  
 — nitrosomethyl ketone, 585.  
 — sulphaminebenzoate [ortho-], 992.  
 — sulphide, platinum-compounds of, 367.  
 Propylamine, magnetic rotatory power of, TRANS., 692, 730.  
 — tribromo-, 117.  
 Propylanthranyl propyl ether, 895.  
 Propylbenzyl cyanide, 861.  
 Propyldeoxybenzoin, 512.  
 Propyldiphenyl tricyanide, 697.  
 Propylene, liquefaction of, 1126.  
 — pentachloro-, 1136.  
 Propylenediisomylamine acetate, 119.  
 — benzoate, 118.  
 Propylenes,  $\alpha$ -bromo-, and  $\alpha$ -isobromo-, 236.  
 —  $\alpha$ -chloro- and  $\alpha$ -isochloro-, 236.  
 Propyl-group, isomeric change in, 1185.  
 Propylenesacetic acid, preparation and derivatives of, 599  
 Propyldenediethylsulphone, 1232.  
 Propyldenedimethylsulphone, 1232.  
 Propylmalonic acid, thermochemistry of, 1097.  
 Propylmethylquinone, orthiodo-, 993.  
 Propylmethylquinonemonoxime, iodo-, 993.  
 Propyloxanthranol, 895.  
 Propylphenylacetic acid, 861.  
 Propylphycite, 31.  
 Proteid metabolism in man, 174.  
 — influence of urethane, paraldehyde, antipyrin, and antifebrin on, 534.  
 — poisons, 1026.  
 Proteids, action of salts on, 425.  
 — decomposition of, in green plants kept in the dark, 642.  
 — estimation of, with special reference to those of milk, 450.  
 — of serum, action of salts on the, 424.  
 — of the blood, production of, 532.  
 — of white of egg, 1075.  
 — relative digestibility of, 734.  
 — solution and precipitation of, by salts, 787.  
 — the sulphur of, 528.  
 Protein, estimation of the digestibility of, 913.  
 Protoelastose, 423.  
 Protomyosinose, 423.  
 Protophyllin in etiolated plants, 1236.  
 Protoplasm and hæmoglobin, reciprocal action between, 629.  
*Protopterus annectens*, the cyst of, 793.  
 Prout's hypothesis, in reference to the atomic weights of carbon and oxygen, 463.  
 Prussian blue, soluble, 475.  
 Pseudephedrine and its derivatives, 1020.  
 Pseudobrookite, 680.  
 Pseudobutylene, brominated derivatives of, 575.  
 — bromo-, conversion of crotonylene hydrobromide into, 576.  
 — constitution of, 576.  
 Pseudocumene, dinitrobromo-, 39.  
 — symmetrical bromo-, action of sulphuric acid on, 994.  
 — symmetrical iodo-, action of sulphuric acid on, 995.  
 Pseudocumenesulphonic acid, iodo-, 995.  
 — acids bromo-, isomeric, 994.  
 Pseudocumyl cyanate, 241.  
 — cyanurate, 241.  
 Pseudocumylazoresorcinol, nitroso-, 137.  
 Psilomelane, 216.  
 Pterocarpin from red sandal wood, 160.  
 Ptomaine from the cuttle fish, 421.  
 — new, 1074.  
 Ptomaines, 733.

- Ptomaines and their genesis in relation to Panum's sepsin, 421.  
 — in cystinuria, 1024.  
 — relation of, to infectious fevers, 1026.  
 Pumice, solubility of, in sea water, 682.  
*Purpura lapillus*, colouring matter of, 1207.  
 Purpureocobaltic tungstate, 1117.  
 — vanadate, 1117.  
 Purpureo-iridium salts, 352.  
 Pus, Vitali's test for, 1040.  
 Putrefaction, disengagement of free nitrogen during, 738, 739.  
 Putresine and tetramethylenediamine, identity of, 33.  
 Pyranilpyroic acid, 142, 1174.  
 Pyrazole, 409.  
 — monosubstituted derivatives of, and hydrogenated compounds derived therefrom, 1215.  
 Pyrazolic bases, compounds of, with alloxan, 517.  
 Pyrazolones, meta-, 56.  
 Pyridine, conversion of anhydroecgonine into, 909.  
 — formation of, from amidoazonaphthalene, 728.  
 — magnetic rotatory power of, TRANS., 700, 734.  
 — mono- and di-bromo-, preparation of, 1212.  
 Pyridinecarboxylic acid, distillation of salts of, 1212.  
 Pyridineorthodicarboxylic acid, 1016.  
 Pyridinephenyleneketonesulphonic acid,  $\beta$ -, 527.  
 Pyrimidines, 1004, 1006.  
 Pyrites, burnt, estimation of sulphur in, 306.  
 — decomposition of, in a stream of oxygen, 1244.  
 — new method of analysing, 1243, 1244.  
 Pyrochlorite in a rock from Colorado, 1054.  
 Pyrocresole,  $\alpha$ -, derivatives and new colouring matters from, TRANS., 51.  
 Pyrogallocarboxylic acid, thermochemistry of, 1096.  
 Pyrolusite, from Augusta Co., Virginia, 470.  
 Pyromellitic acid, thermochemistry of, 1096.  
 Pyromorphite from Leadhills, TRANS., 93.  
 — preparation of, 21.  
 Pyromucic acids, substituted, 37, 386.  
 Pyrophosphamic acid, 210.  
 Pyrophosphotriamic acid, 210.  
 Pyrotartaric acid, heat of combustion of, 5.  
 Pyrotartaric acid in suint, 178.  
 — — specific heat of, 93, 94.  
 — chloride, 1059.  
 Pyrroarsenite, 217, 218.  
 Pyrrolidone, derivatives of, 1211.  
 Pyrroline and carbazole, similar reactions of, 260.  
 — and its derivatives, behaviour of, as regards Raoult's law, 901.  
 — conversion of, into tetramethylenediamine, 1208.  
 — homologues of, direct synthesis of, 727.  
 Pyrroline-derivatives, action of methyl iodide on, 58.  
 — conversion of into indole-derivatives, 400.  
 Pyrrolinehydroxylamine, preparation of, 1208.  
 Pyrroline-phthalide, dibromo-, and nitro-, 58.  
 Pyruvic acid and ethyl acetoacetate, condensation of, 593.  
 — chlorination of, 489.  
 — condensation of, with sodium succinate and acetic anhydride, 1146.  
 — dibromo-, compounds of, with hydrazines, 237.  
 Pyroxenites of Morbihan, 109.

## Q.

- Quantitative estimations by measurement of electrical conductivity, 545.  
 Quartz pseudomorphs after spodumene, 24.  
 Quassin, constitution of, 278.  
 Quercitol, 581.  
 Quillajic acid, 55.  
 Quinaldine, condensation of, with para-nitrobenzaldehyde, 527.  
 — metamido, 520.  
 — methiodide,  $\gamma$  chloro-, 520.  
 Quinaldineacrylic acid, meta-, 521.  
 Quinaldinealdehyde, meta, 522.  
 Quinazoline,  $\beta$ - $\delta$ -dichloro-, 610.  
 Quince mucus, 541.  
 Quinic acid, acetyl-derivatives of, 991.  
 — — specific rotatory and refractive power of, 453.  
 Quinicine, oxidation of, 1074.  
 Quinidine, cincholeupone from, 1073.  
 — constitution of, 626.  
 Quinine, action of bromine-water on, 730.  
 — catechol sulphate, 908.  
 — constitution of, 626.  
 — estimation of, by Kerner's method, 323.  
 — orcinol sulphate, 908.  
 — oxidation of, 626.  
 — phenol sulphate, 908.

- Quinine, recent processes for testing, 86.  
 — sulphate, potassium sulphate as a reagent for the purity of, 1091.  
 — tetrabromide, 730.  
 Quinol diamido-, 968.  
 — dibenzyl ether, 1152.  
 — diethyl ether, 967.  
 — nitrodiimido-, 968.  
 — sulphate, triamido-, 968.  
 Quinoline, 1214.  
 — arsenous bromide, 211.  
 —  $\gamma$ -bromo-, amido-, and nitro-derivatives of, 728.  
 — 4 : 4'-dibromo-, 729.  
 — series, transition from the coumaric series to, 990.  
 — vapour-pressures of, TRANS., 483.  
 Quinoline-derivatives from ethyl ortho-nitrobenzoylmalonate, 519.  
 — from isatinic acid, 412.  
 — reduction of, 518.  
 Quinolinediacrylic acid,  $\alpha$ -meta-, 523.  
 Quinolineorthosulphobromamide, 981.  
 Quinolineorthosulphonamide, 981.  
 Quinolinequinoneanilide, anilido-, 62.  
 Quinolines, amido- and nitro-meta-bromo-, 281.  
 — metabromo-, 280.  
 Quinone and ethyl acetoacetate, condensation-product of, 42.  
 — diamlido-, 968.  
 — paradichloroparoximido-, 244.  
 Quinone-derivatives, influence of the presence of halogens and alkyl-groups on the replacement of oxygen by the isonitroso-group in, 243.  
 Quinoneoximes, derivatives of, 244.  
 Quinones, halogen-substituted, action of alkalis and ammonia on, 707.  
 — iodo-, 993, 1184.
- R.**
- Raffinose, 953.  
 — and saccharose, simultaneous estimation of, 1249.  
 — compounds of, with bases, 846.  
 — estimation of, in beet-sugar, 192.  
 — estimation of, in the products of the beet sugar manufacture, 656.  
 Rails, rusting of, 214.  
 Rain of tropical districts, nitrates in the, 923.  
 Rain-water. See water, rain-.  
 Raoult's law, lecture experiments on, 336.  
 — of freezing, 565, 566.  
 — method for determining molecular weights as used to distinguish between isomerism and polymerism, 754.
- Red sandal wood, homopterocarpin from, 160.  
 Red silver ore, decomposition of, by air containing bromine, 1243.  
 Reduction of silver nitrate in the living cell, 1028.  
 Reed canary grass, analyses of, 1078—1082.  
 Refraction and dispersion of light and magnetic rotation by compounds containing nitrogen, correspondence between the, TRANS., 750.  
 — and molecular volume, new theory of, 326.  
 — molecular, 454.  
 — of fumaric, maleic, mesaconic, citraconic, and itaconic acids, and of thiophen, 198.  
 — of liquids within wide ranges of temperature, 197.  
 Refractions, atomic, calculation of, for sodium light, 661.  
 Refractive indices of turbid media, 197.  
 — power and specific rotatory power of compounds, relations between, 326, 453.  
 Rennet in human urine, 536.  
 Resin, Dammara, 621.  
 — hydrocarbon obtained by the action of sulphur on, PROC., 102.  
 — of *Myoporum platycarpum*, TRANS., 665.  
 — oil, test for, in mineral and vegetable oils, 86.  
 — pine wood, a delicate reaction for, 660.  
 — products of the action of sulphur on, PROC., 102.  
 — Russian white, from *Pinus sylvestris*, 406.  
 Resins, examination of, 322.  
 — fossil, from the coal measures, 353.  
 Resorcindialdehydephenylhydrazone, 252.  
 Resorcinol, action of iodine on, in alkaline solution, 1151.  
 — action of phenylhydrazine on, 1162.  
 — azo-dyes, nitroso-derivatives of, 137.  
 — detection of, 1090.  
 — iodoxydiiodo-, 1151.  
 — methyl ether, paramido-, 1155.  
 — nitrodiimido-, 969.  
 — nitronitroso-, 41.  
 Resorcindisulphonic acids, amido-, nitro-, and nitroso-, 510.  
 Resorcinyal allophanate, 394, 965.  
 — dimethyl ether, paramido-, and its derivatives, 1155.

Resorcyaldehydephenylhydrazone, 252.  
 Resorcylic acid,  $\beta$ -, thermochemistry of, 1096.  
 Respiration experiments on the horse, 911.  
 — in the living cell, 1028.  
 — plant, transpiration of force and of material in, 540.  
 Retene dodecahydride, 720.  
 Rhamnodiazine, 485.  
 Rhamnose, oxidation of, 952.  
 Rhamnosecarboxylic acid, reduction of, 1149.  
 Rhamnosone, 484.  
*Rhamnus frangula*, constituents of the bark of, 68.  
*Rhamnus purshiana*, constituents of the bark of, 68.  
 Rhodanic acid, 960.  
 — — new synthesis of, 961.  
 Rice, manuring of, 646.  
 Ricinoleic acid, oxidation of, 1147.  
 Riebeckite, 109.  
 Rivers, black, of equatorial regions, 226.  
 Rock from Colorado, containing sodium amphibole, astrophyllite, pyrochlorite, and zircon, 1054.  
 Rock-crystal, electrolytic conductivity of, 91.  
 Rocks, acidic, eruptive, and solfataras, relation between, 474.  
 — from the shore at Nice, 223.  
 — of the Vulsinian volcanoes, 224.  
 — of Pigeon Point, Minnesota, 473.  
 Roots, acid juice excreted by, 68.  
 Rosemary, camphor and borneol of, 1002.  
 Rotatory power and refractive power of chemical compounds, relation between, 326, 453.  
 — — of isocamphols, influence of solvents on, 1206.  
 Rubeanwasserstoff, 1142.  
 Rufigallol, action of halogens on, 405.  
 Rusting of rails, 214.  
 Ruthenium, ammoniacal derivatives of, 948.  
 — atomic weight of, 352, 835.  
 — chloride, ammoniacal derivatives of, 948.  
 — nitrosochloride, 352.  
 — nitroso-compounds of, 678.  
 Rye, soiling, digestibility of, 735.

S.

Saccharin, reduction of, 1149.  
 "Saccharin," Fahlberg's, detection of, 448, 449.  
 — — detection of, in beer, 322.

"Saccharin," Fahlberg's, test for, 86.  
 — — influence of, on digestion, 1022.  
 Saccharose and raffinose, simultaneous estimation of, 1249.  
 Saccharoses, formation of, from formaldehyde, 581.  
 Saffranine, benzylated, TRANS., 595.  
 Salep mucus, 541.  
 Salicaldehyde, azo-compounds of, 779.  
 Salicaldehydemetazobenzenesulphonic acid, 780.  
 Salicaldehydeparazobenzenesulphonic acid, 779.  
 Salicylalcohol, azo-compounds of, 779.  
 Salicylaldoxime, 255.  
 Salicylamide, azo-compounds of, 779.  
 Salicylamidoparazobenzenesulphonic acid, 780.  
 Salicylamidoxime, 255.  
 — ethyl carbonate, 255.  
 Salicylamidoximepropenyl- $\omega$ -carboxylic acid, 255.  
 Salicylhomophthalopropylimide, 256.  
 Salicylhydroxamic acid, 870.  
 Salicylic acid, artificial, estimation of foreign acids in, 447.  
 — — azo-compounds of, 780.  
 — — detection and estimation of, especially in beer, 195.  
 — — estimation of, 446.  
 — — in beer, detection of, 446.  
 — — in certain genera of the *Liliaceæ*, PROC., 122.  
 — — sulphonic derivatives of, 1062.  
 — — use of, for preserving standard solutions, 73.  
 — compounds, melting points of, TRANS., 549.  
 Salicylonitrile, 255.  
 Saline hydrates, dissociation of, 815.  
 — powders in the atmosphere, origin of, 945.  
 Saliva, formation of nitrous and nitric acids in, from formaldehyde and ammonia, 1228.  
 — secretion of, 534.  
 Salt in rain-water, 299.  
 — solutions, constitution of, inferred from their behaviour with carbonic anhydride, 1044.  
 — — density and expansion by heat of, 329.  
 — — dilatation of, 204, 330, 1101.  
 — — electrical conductivity of, 808, 809.  
 — — rise of, in capillary tubes, 205.  
 — — specific heats of, 4.  
 Salts, conditions of equilibrium between solid and liquid compounds of water with, 752.

- Salts, dissolved, electrical transport of, 665.  
 — fused, electrical conductivity of, 457.  
 — general law of diminution of volume of, by solution in water, 461.  
 — precipitation of colloid substances by, 99.  
 — relation between the solubility of salts and their melting points, 460.  
 — solubility of, 671.  
 — soluble, determination of the specific gravity of, 1101.  
 — soluble in water, determination of the specific gravity of, 812.  
 — volumes of, in solution, 1044.
- Sarcolemma of muscle fibres, action of digestive fluids on, 913.
- Sawarri fat, PROC., 69.
- Scheelite, commercial, analysis of, 311.
- Scopoletin, 255.
- Sea sludge. See sludge.
- Sebacic acid, boiling points of, 691.  
 — — heat of combustion of, 5.  
 — — thermochemistry of, 1097.
- Seeds, carbohydrates in, 916.  
 — leguminosæ, soluble carbohydrate in, 644.  
 — of plants, lecithin in, 645.  
 — of *Vicia sativa*, presence of betaine and choline in, 1029.  
 — solubility of the constituents of, 1028.
- Selenazole-compounds, 726.
- Selenazylamine, 727.
- Selenhydantoin, 737.
- Selenious anhydride, compounds of ammonia with, 103.
- Selenium-compounds, aromatic, synthesis of, 41.  
 — — of the benzene series, 1167.  
 — electromotive force of, 3, 202, 555.
- Selenocyanacetic acid, 726.
- Selenocyanacetone, 726.
- Selenocyanacetophenone, 726.
- Selenocyanogen-compounds, 726.
- Selenophenol, 1167.
- Seminose, 687.
- Separation of ethereal solutions from aqueous liquids, 1086.
- Sepsin, Panum's, ptomaines and their genesis in relation to, 421.
- Serpentine rock of Colle di Cassimoreno and Monte Ragolo, 111.
- Serum, milk, analyses of, 634.  
 — proteids of, action of salts on the, 424.
- Sesame oil, density and refractive index of, 86.
- Sesquiterpene, and its derivatives, rotatory power of, 1072.
- Shaking, apparatus for, 934.
- Shells, solubility of, in sea-water, 682.
- Sherry, pure, analyses of, 476.
- Siennas, 678.
- Silicates, decomposition of, for analysis, 440.  
 — estimation of water in, 546.  
 — natural, treatment of, with hydrochloric acid as a means of ascertaining their structure, 23.  
 — natural, estimation of titanium in, 443.
- Silicoformic acid, preparation of, 343.
- Silicon, action of, on gold, silver, platinum, and mercury, 1125.  
 — bromoform, preparation of, 343.  
 — chloroform, preparation of, 342.  
 — compounds and their derivatives, TRANS., 474.  
 — preparation of, 211, 212, 342.  
 — preparation of, by electrolysis, 103.  
 — tetrabromide, tetrachloride, and tetriodide, preparation of, 342.
- Silico-organic compounds of a new type, 504.
- Silicotetra- $\alpha$ -naphthylamide, TRANS., 482.
- Silicotetra- $\beta$ -naphthylamide, TRANS., 481.
- Silicotetraorthotolylamide, TRANS., 480.
- Silicotetraparatolylamide, TRANS., 478.
- Silicotetraphenylamide, TRANS., 475.
- Silver, action of silicon on, 1125.  
 — ammonio-antimonate, 1124.  
 — and gold, estimation of, when contained in potassium cyanide solutions, 189.  
 — antimonate, 1124.  
 — caproate, solubility of, 122.  
 — chloride, cyanide, thiocyanate, ferricyanide, and ferrocyanide, analysis of a mixture of, 83.  
 — — vapour-density of, 674.  
 — chromates, 1121.  
 — diethacetate, solubility of, 122.  
 — effect of, on the freezing point of sodium, TRANS., 674,  
 — haloid salts of, decomposition of, by light, 199.  
 — molecular weight of, TRANS., 532, 533.  
 — of M. Stas, occlusion of oxygen in, TRANS., 400.  
 — periodates, TRANS., 152.  
 — pure, properties of, TRANS., 399.  
 — volumetric estimation of, 1246.
- Slag, basic, assimilation of the phosphoric acid of, 647.  
 — — comparison of, with superphosphate, 745.  
 — — estimation of phosphoric acid in, 439.  
 — — value of, as a manure, com-

- pared with soluble phosphate and bone meal, 299.
- Slag, furnace, gehlenite in, 681.
- Sludge, sea, and its absorptive power for lime and potash, 1241.
- Soap, estimation of fatty acids in, 194.
- estimation of free alkali in, 448, 1037.
- Soda, arsenic in, 341.
- coefficient of diffusion of, 1047.
- heat of neutralisation of, 811.
- raffinose, 846.
- Soda-lime, true rôle of, in the estimation of nitrogen, 306.
- Sodiovanadyl fluoride, 1123.
- Sodium, action of bromine and iodine on, 755.
- aluminates, 213.
- amphibole in a rock from Colorado, 1054.
- benzenesulphinate, action of sodium dibromhydrocinnamate on, 994.
- boiling point of, TRANS., 326.
- bromide, compound of arsenious acid with, 103.
- chloride, blue flame produced by, in a coal fire, 336.
- ethoxide, action of iodine on, 363.
- gold alloys, properties of, TRANS., 670.
- hydrogen carbonate, detection and estimation of, in milk, 1244.
- iodide, compounds of arsenious acid with, 103.
- lowering of the freezing point of, by the addition of other metals, TRANS., 666.
- methyl dinitrophenylacetate azobenzenesulphonate, 507.
- methoxide, elimination of carbonic anhydride by aid of, 1126.
- molecular weight of, TRANS., 527, 530, 533.
- naphthaphenanthrazinesulphonate, 274.
- nitrate and ammonium sulphate, comparative manurial value of, 1085.
- — and ammonium sulphate, comparative manurial value of the nitrogen in, 436.
- nitroethane, action of alkyl iodides on, 365.
- nitrotartrazinesulphonate, 881.
- paramethylhexadecylbenzenesulphonate, 130.
- phenoxyacrylate, behaviour of ammonia and organic bases with, 988.
- phenylhydrazine, 1158.
- — action of acid chlorides and anhydrides on, 1159.
- — action of alkyl bromides and of benzyl chloride on, 1158.
- Sodium, phosphite, 569.
- platinate, 1125.
- potassium sulphite, 942, 1106.
- — thiosulphate, 943.
- silver thiosulphate, 943.
- sulphate, presence of, in the atmosphere, 816, 945.
- sulphites, 1106.
- thiosulphate, action of sulphurous acid on, 568.
- — behaviour of, with acids, 943, 1107.
- — behaviour of, with metallic salts, 1107.
- — zinc oxides, 674.
- Soil, arable, formation of ammonia in, 1240.
- changes within the, in the formation of a meadow, 921.
- detection of nitrates in, 649.
- from Washington territory, analysis of, 435.
- heavy, manuring experiments on, 300.
- humous compounds in, 543.
- samples, collection and preparation of, 921.
- Soils, absorption of atmospheric nitrogen by, 1238.
- absorption of nitrogen by, 743.
- acid, leguminosæ in, 434.
- action of ferrous sulphate on various, 436.
- action of water containing sodium chloride on, 795.
- Algerian, 436.
- calcium in, 542.
- clay, absorption of nitrogen by, 1237.
- detection of nitrates in, 547.
- influence of calcium sulphate and clay on the absorption of nitrogen by, 1239.
- loss and gain of nitrogen in, 745.
- of different degrees of fertility, formation of nitrates in, 70.
- percentage of carbonic anhydride in the air of, 1030.
- source of error in the estimation of nitrates in, 438.
- vegetable, and atmospheric nitrogen, 1237.
- — estimation of nitrogen in, 307.
- — evolution of ammonia and volatile nitrogen-compounds from, 1238.
- — influence of electrification on the absorption of nitrogen by, 1237.
- Solfataras and acidic eruptive rocks, relation between, 474.
- Solids, chemical action between, 817.



- Solubility of gases, 670.  
 — of minerals in sea water, 682.  
 — of salts, 671.  
 — of salts and their melting points, relations between, 460.  
 Solution, kinetics of substances in, 327.  
 — nature of, 941, 1101, *PROC.*, 86, 106.  
 Solutions, aqueous, specific gravities of, 1044.  
 — — vapour-pressure of, 668.  
 — colloidal, physical properties of, 98.  
 — constitutions of, 98.  
 — contraction of, 1102.  
 — densities, heat capacities and electrical conductivities of, *PROC.*, 86.  
 — evidence afforded by fluorescence and absorption of the decomposition of molecular groups in, 554.  
 — law of freezing points of, *PROC.*, 149.  
 — mechanical, physical, and chemical lowering of the freezing points of, *PROC.*, 150, 151.  
 — nature of, *PROC.*, 86, 106.  
 — of one metal in another, 932, 933.  
 — saline, electrical conductivity of, 808, 809.  
 — specific gravity of, 814.  
 — study of the freezing temperatures of, *PROC.*, 106.  
 Sorbic acid, heat of combustion of, 460.  
 Sorbinose, constitution of, 116.  
 Sorbite and its occurrence in the fruits of the Rosaceæ, 580.  
 — dibenzoic acetal of, 479.  
 — estimation of, 478.  
 — extraction of, 478.  
 — hexyl iodide from, 841.  
 — nitro-derivative of, 580.  
 — oxidation of, 580.  
 Sorbose, fermentation of, 480.  
 Sound, velocity of, in vapours as a means of determining the vapour-density, 460.  
 Soxhlet extractor, improved, *TRANS.*, 359.  
 Specific gravities of aqueous solutions, 1044.  
 — — and volumes of benzene and its halogen-derivatives, *TRANS.*, 458.  
 — gravity of isomorphous mixtures, 931.  
 — — of salts soluble in water, determination of, 812.  
 — — of soluble salts, determination of, 1101.  
 — — of solutions, 814.  
 — — of some fats and oils, 801.  
 — heat of mercury, variation of, with temperature, 750.  
 — — of sea water of different densities, 666.  
 — — of some solid organic compounds, 92.  
 — — of tellurium, 203.  
 Specific heats at high temperatures, 4.  
 — — of gases at constant volume, 459.  
 — — of saline solutions, 4.  
 — — rotatory power and refractive power of compounds, relation between, 453.  
 — — — of tartaric acid, change of the, in mixed solutions, 378.  
 — — volumes of camphor and borneol, 785.  
 — — — of similar compounds of elements, *TRANS.*, 486.  
 Spectra, absorption-, and the composition of organic compounds, relations between the, 1093.  
 — — of blue solutions, 325.  
 — — of cobalt-compounds, *PROC.*, 14.  
 — — — of epidote, 553.  
 — — — of ferric chloride, *PROC.*, 14.  
 — — — of the elements of the didymium group, *TRANS.*, 259.  
 — — — of the elements of the erbium group, *TRANS.*, 265.  
 — — — incandescence, *TRANS.*, 267.  
 — — — invisible lunar and solar, 325.  
 — — — metallic, 1.  
 — — — of the yttrium groups of elements, *TRANS.*, 269.  
 — — — phosphorescence, *TRANS.*, 267.  
 — — — action of different earths on, *TRANS.*, 275.  
 — — — interference of, *TRANS.*, 276.  
 — — — reversion, *TRANS.*, 279.  
 — — — sharp line of phosphorescent alumina, *TRANS.*, 281.  
 — — — ultra-violet, of nickel and cobalt, 89.  
 Spectro-colorimetric estimation of iron and thiocyanates, 1247.  
 Spectrophotometry, applications of, to chemical physiology, 73.  
 Spectroscope, recent researches on the rare earths as interpreted by, *TRANS.*, 255.  
 Spectrum, absorption-, of oxygen, 1.  
 — — of cadmium, analysis of, 455.  
 — — of magnesium, 89.  
 — — of thiophosphoryl fluoride, *TRANS.*, 322.  
 Sperrylite, 471.  
 Spessartine, 473.  
 Spiders, guanine in the excrement of, 430.  
 Spirituous liquids, examination of, 654.  
 Spirits, estimation of fusel oil in, 190.  
 Spleen, hæmoglobin in blood passing to and from, 1023.  
 Sputum, nitrogen in, 1076.  
 Standard solutions, use of salicylic acid for preserving, 73.  
 Stannic acid, heat of neutralisation of, 833.

- Stannic chloride, action of water on, 1121.  
 — oxide, variations in the acid function of, 833.  
 — sulphide, 1053.  
 Stannous chloride, volumetric estimation of, 189.  
 Star fish, manurial value of, 1085.  
 Starch, changes suffered by, when dissolved in hot glycerol, 116.  
 — combination of, with copper oxide, 1133.  
 — compounds of, with the alkaline earths, 316.  
 — conversion of, in the human stomach, 631.  
 — formation of cane-sugar from, 1132.  
 — formation of, from methylal, methyl alcohol, &c., 67.  
 — soluble, action of diastase on, TRANS., 456.  
 — — molecular weight of, TRANS., 465.  
 — — properties of, TRANS., 450.  
 — — relation of amylopectin to, TRANS., 449.  
 — solution, preparation of, for use in volumetric analysis with iodine, 73.  
 Starvation, influence of, on the glycogen of the liver and muscle, 427.  
 Stearic acid, conversion of oleic acid into, 1140.  
 Stearolic acid, oxidation of, 375.  
 Steel, estimation of carbon in, 186, 308.  
 — of phosphorus in, 76.  
 Stilbene, attempted formation of a geometrical isomeride of, 51.  
 — group, isomerism of members of, 261.  
 — heat of combustion of, 6, 460.  
 — sulphide, diamido-, 602.  
 Stilbenediamine, derivatives of, 1191.  
 Stomach, can the mucous membrane of the, decompose bromides and iodides, 426.  
 — contents, estimation of hydrochloric acid in, 302.  
 — horse's, sugar contents of, 176.  
 — human, conversion of starch in, 631.  
 Stromata of the red corpuscles, 1231.  
 Strontia raffinose, 846.  
 Strontianite from Althahlen, 837.  
 — from Leadhills, TRANS., 95.  
 Strontium acetoxyponitrite, 945.  
 — arsenates, 826  
 — calcium and barium, separation of, 77.  
 — hyponitrite, 945.  
 — malonate, 691.  
 — nitrate, solubility of, in alcohol, 345.  
 Strontium sulphide, phosphorescent, preparation of, 198.  
*Strophanthus*, glabrous, crystalline compound from, 407.  
 Strychnine benzyl hydroxide and salts, 626, 627.  
 — separation of, from brucine, 748.  
 Styphnic acid, constitution of, 130.  
 Suberic acid, boiling points of, 691.  
 — — heat of combustion of, 5.  
 — — thermochemistry of, 1097.  
 Sublimation apparatus, 463.  
 Succinaldioxime, 1208.  
 Succinbenzylamic acid, TRANS., 630.  
 Succinbenzylimide, TRANS., 629.  
 Succindibenzylamide, TRANS., 631.  
 Succindihydrazone, 1208.  
 Succinic acid, action of ethylenediamine on, TRANS., 10.  
 — — and ethyl acetoacetate, condensation of, 592.  
 — — and ethyl benzoylacetate, condensation of, 594.  
 — — boiling points of, 690.  
 — — heat of combustion of, 5.  
 — — specific heat of, 93, 94.  
 — — thermochemistry of, 1097.  
 — acids, bromo-, electrolysis of, 1056.  
 — — dibromo-, action of phosphorus sulphides on, 237.  
 — — disubstituted, 959.  
 — chloride, action of zinc ethyl on, 1059.  
 Succinimide, bromo-, 1064.  
 Succinomonobenzylamide, TRANS., 632.  
 Succinomononitrile, 686.  
 Succinonitrile, heats of combustion and formation of, 812.  
 Succinosuccinic acid, 1147.  
 Succinylodiphenylhydrazine, 960.  
 Sugar, beet-, estimation of raffinose in, 192, 656.  
 — cane-, formation of, from starch, 1132.  
 — — from maize, 917.  
 — — rate of change in the inversion of, by acids, 1103.  
 — detection of, in urine, 85, 552.  
 — estimation of, by Fehling's solution, 1036.  
 — estimation of, in beet by digestion in water, 314.  
 — estimation of, in molasses, 191.  
 — estimation of, in presence of carbohydrates, 85.  
 — formation of, in yeast, 1027.  
 — grape-, crystalline form of, 1041.  
 — — safraniline as a reagent for, 446.  
 — in ascitic fluid, 291.  
 — in the stomach of the horse, 176.  
 — invert-, 479.

- Sugar, invert-, detection of, by means of Soldaini's solution in presence of cane-sugar, 313.  
 — milk, assimilation of, 735.  
 — — estimation of, in milk by the polariscope, 315.  
 — — oxidation of, 485.  
 — obtained from *Plantago psyllium*, 233.  
 — post-mortem formation of, in the liver, 176.  
 — presence of, in the aqueous humour, 177.  
 — solubility of, in water, 846.  
 — specific heat of, 93, 94.  
 — tin in, 1036.  
 Sugar-cane, fermentation of the juice of, 915.  
 Sugar-group, reduction of acids of the, 1149.  
 — — — synthetical researches in, 484.  
 Sugar-like compound from *Laminaria*, 687.  
 Sugars, analysis of, 191.  
 — benzoyl-compounds of, 1152.  
 — compounds of copper oxide with, 1133.  
 — compounds of phenylhydrazine with, 484.  
 — fermentation of, 480.  
 — from fungi, 740.  
 — rapid estimation of, 1088.  
 — reduction of copper salts by, 1055.  
 — relation between the rotatory and refractive powers of, 326.  
 Suint, glycollic acid and pyrotartaric acid in, 178.  
 Sulphaminebenzoic acid, paranitroortho-, 711.  
 — anilide, ortho-, 992.  
 — orthotoluide, ortho-, 993.  
 — paratoluidide, ortho-, 993.  
 Sulphanilic acid, orthonitro-, 880.  
 Sulphates, volumetric estimation of, 306, 1087.  
 Sulphides, decomposition of, by air containing bromine, 1243.  
 — metallic, 677.  
 — — action of alkyl iodides on, 1136.  
 Sulphines, 115, 234, 1135.  
 Sulphites, 942, 1106.  
 Sulphobenzoic acid, amido, 144.  
 — — ortho-, 1183.  
 — — — and its derivatives, 709, 881, 992.  
 — — — paranitroortho-, 711.  
 — — anhydride, 709.  
 — — ortho-, 992.  
 — — chloride, chloro-, 992.  
 Sulphobenzylidenethiocarbimidoacetic acid, 960.  
 Sulpho- $\delta$ -bromopyromucic acid,  $\beta$ -, 386.  
 Sulphocaproic acid, 121.  
 Sulphocumic acid, meta-, 1185.  
 Sulphofluorescein, 710.  
 Sulphofumaric acid, 386.  
 Sulphohalite, 217.  
 Sulphoisovaleric acid, 35.  
 Sulphonefluorescein, 710.  
 Sulphonaphthalene, 710.  
 Sulphones, formation of, on sulphonating naphthalene-derivatives, *Proc.*, 121.  
 — — relation between the physiological action and chemical constitution of, 1232.  
 Sulphonic acids, decomposition of, in presence of phosphoric acid, 1200.  
 Sulphophenylazotetrahydroamidonaphthol, 784.  
 Sulphophenylazo- $\alpha$ -tetrahydronaphthylamine, 715.  
 Sulphophenylcarbamic amid, 144.  
 Sulphopropylbenzoic acid, meta-, 1186.  
 Sulphopyromucamide,  $\delta$ -, 37.  
 Sulphopyromucic acid,  $\beta$ -, 386.  
 Sulphopyromucic acid,  $\delta$ -, and its derivatives, 37.  
 Sulphosalicylic acid, 1063.  
 Sulphur, affinity of the heavy metals for, 468.  
 — amides of, 210.  
 — attraction of animal tissues for, 633.  
 — behaviour of, in the organism, 432.  
 — combustion of, in dried oxygen, 465.  
 — detection of, in organic compounds, 796.  
 — dissemination of, in masses of metal, 13.  
 — estimation of, in burnt pyrites, 306.  
 — estimation of, in iron, 648.  
 — estimation of, in organic compounds, 81.  
 — influence of, on Eggertz's carbon colour test, 76.  
 — molecular weight of, 340.  
 — remarkable bed of, 215.  
 — state of combination of, in proteids, 528.  
 — — valency of, 115, 1135.  
 — vapour density of, at a white heat, 674.  
 — — volumetric estimation of, 437.  
 Sulphuric acid, causes affecting the lowering of the freezing point of solutions of, *Proc.*, 150.  
 — — coefficient of diffusion of, 1047.  
 — — electrical conductivity and electrolysis of concentrated solutions of, 556.

Sulphuric acid, estimation of, as barium sulphate, 1032.  
 ——— estimation of, in presence of iron, 926, 1244.  
 ——— estimation of, in rain water, TRANS., 545.  
 ——— free, detection of, in aluminium salts, 648.  
 ——— heat of dissolution of, PROC., 88.  
 ——— heat of neutralisation of, TRANS., 323.  
 ——— hydrates of, PROC., 88, 106, 128, 151.  
 ——— new hydrate of, 941.  
 ——— solutions, densities, heat capacities, and electrical conductivities of, PROC., 87, 88.  
 ——— freezing points of, PROC., 106.  
 ——— tetrahydrate existing in solution, isolation of, PROC., 128.  
 ——— theory of the lead chamber process, 103.  
 ——— total, in urine, relation between, and that existing as ethereal sulphates in rest and work, 430.  
 ——— volumetric estimation of, 75, PROC., 5.  
 ——— anhydride, compound of, with boric acid, TRANS., 155.  
 ——— compounds of arsenious oxide with, TRANS., 157.  
 Sulphurous acid, action of, on sodium thiosulphate, 568.  
 ——— and carbonic anhydrides, isotherms of a mixture of, 753.  
 Sulphurylamide, imido-, 211.  
 Sumach, Caucasian wild, tannic acid in, 541.  
 Sunflower oil, 956.  
 Superphosphate, comparison of basic slag with, 745.  
 ——— concentrated, analysis of, 1246.  
 Superphosphates, action of, on nitrates, 72.  
 Suprarenal capsules, chemical examination of, 290.  
 Sussexite from New Jersey, 356.  
 Sweet grass, floating, analyses of, 1078-1082.  
 Sylvanecarboxyacetic acid, identity of, with methronic acid, 126.  
 Sylvestrene and its derivatives, rotatory power of, 1072.  
 Sylvestrenenitrobenzylamine, 1071.  
 Syringenin, 159.  
 Syringic acid, 159.  
 Syringin, 159.  
 Syringinaldehyde, 159.

## T.

Taenite, 766.  
 Tanghinin from *Tunghinia venenifera*, 900.  
 Tannic acid in Caucasian wild sumach, 541.  
 ——— tests for, 447.  
 Tannin as a reserve material in evergreen leaves, 540.  
 ——— physiology of, 917.  
 ——— rôle of in leaves, 917.  
 ——— tea-, estimation of, 1092.  
 Tanning liquors, estimation of the acids in, 195.  
 Tannin-red, 285.  
 Tartar emetic, estimation of antimony in, 445.  
 ——— specific rotatory power and refractive power of, 453.  
 Tartaric acid, action of heat on, in aqueous solution, 36.  
 ——— and citric acid, estimation of, when mixed, 447.  
 ——— change in the rotatory power of, in mixed solutions, 378.  
 ——— combination of normal magnesium and lithium molybdates with, 859.  
 ——— Goldenberg's method of estimating, 657.  
 ——— rate of oxidation of, 239.  
 ——— reduction of, 693.  
 ——— acids, isomeric, melting points of, 959.  
 Tartrate solutions, polarisation of, 380.  
 Taste, a plant which destroys the sense of, for sweets and bitters, 182.  
 Tautomeric compounds, 509.  
 Tea, alkaloid from, 416.  
 Tea-tannin, estimation of, 1092.  
 Tectoquinone and its derivatives, PROC., 1888, 116.  
 Tellurium, atomic weight of, TRANS., 382.  
 ——— compound nature of, TRANS., 407, 411.  
 ——— specific heat of, 203.  
 ——— tetrabromide, preparation of, TRANS., 396.  
 Temperature, influence of, on the direction of chemical reactions, 335.  
 ——— of transformation in double decomposition, 930.  
 Terebenthene, dextrorotatory, 157.  
 ——— French essence of, action of heat and acetic acid on, 895.  
 ——— levorotatory, derivatives of, 158.  
 ——— nitro-, 157.  
 Terebic acid, heat of combustion of, 460.  
 Terephthalaldehyde, preparation of, 505.  
 Terephthalamide, paradichloro-, 1179.  
 Terephthalic acid, chloro-, 496.

- Terephthalic acid, chlorobromo- and chlorobromonitro-, 966.  
 ——— acid, preparation of, 601.  
 ——— reduction-products of, 1176.  
 ——— thermochemistry of, 1096.  
 ——— chloride, paradichloro-, 1179.  
 Terpene, specific rotatory and refractive powers of, 453.  
 Terpene-derivatives, rotatory power of, 1071.  
 Terpene-group, isomerism in the, 1069.  
 Terpenes and ethereal oils, 1072.  
 Terpilene from French essence of terebenthene, 897.  
 ——— transformation of, into menthene, 276.  
 ——— heat of combustion of, 328.  
 Terpin, heat of combustion of, 328.  
 ——— hydrate, 1202.  
 ——— heat of combustion of, 328.  
 Tetrabenzoylerythrol, 1152.  
 Tetrabenzoyllevulose, 1153.  
 Tetra benzylmetaphenylenediamine, *TRANS.*, 602.  
 Tetra benzylparaphenylenediamine, *TRANS.*, 600.  
 Tetracetylquinic acid, 991.  
 Tetrahydro-1 : 4'-amidonaphthazo- $\beta$ -naphthylamine, 783.  
 Tetrahydroamidonaphthol, 783.  
 Tetrahydroamidonaphthylhydrazine, 784.  
 Tetrahydrobromotoluquinoline, 1214.  
 Tetrahydrocarbazolecarboxylic acid, 1181.  
 Tetrahydro- $\beta$ -diethylnaphthylamines, isomeric, 1000.  
 Tetrahydrodihydroxyterephthalic acid, 872.  
 Tetrahydroharmine, 730.  
 Tetrahydrohydroxyterephthalic acid, 1180.  
 Tetrahydro- $\beta$ -naphthabenzylamine tetrahydro- $\beta$ -naphthabenzylthiocarbamate, 1198.  
 Tetrahydronaphthalene,  $\alpha$ -, 717.  
 Tetrahydronaphthalenesulphonic acid, hydrolysis of, 1201.  
 Tetrahydronaphthamide,  $\alpha$ -, 716.  
 Tetrahydronaphthoic acid,  $\alpha$ -, 716.  
 Tetrahydronaphthonitrile,  $\alpha$ -, 716.  
 Tetrahydronaphthothioamide,  $\alpha$ -, 716.  
 Tetrahydronaphthylamine,  $\alpha$ -, 715, 782, 784.  
 Tetrahydronaphthylamine-compounds, physiological properties of, 737.  
 Tetrahydronaphthylazobenzylamine,  $\alpha$ -, 715.  
 Tetrahydronaphthylazoresorcinol,  $\alpha$ -, 716.  
 Tetrahydronaphthylenediamine, 1 : 2 (alicyclic), 893.  
 Tetrahydronaphthylenediamine, 1 : 2 (aromatic), 893.  
 ——— 1 : 4 (aromatic), 893.  
 ——— 1 : 4', 782.  
 ——— tetrahydroamidonaphthylthiocarbamate, 1 : 4', 783.  
 Tetrahydronaphthylhydrazine hydrochloride,  $\alpha$ -, 717.  
 Tetrahydronaphthylthiocarbamide, diamido-, 783.  
 Tetrahydroparoxazine, 1218.  
 Tetrahydrophenylmethyl methyl carbinol, ortho-, *Proc.*, 144.  
 Tetrahydro- $\alpha$ -phenyl- $\alpha$ -naphthaquinoline, 412.  
 Tetrahydrophthalic acids, 1176, 1178.  
 Tetrahydroquinoline, oxidation of, 905.  
 Tetrahydroxybenzene, amido-, hydrochloride, 969.  
 ——— Löwy's, real nature of, 878.  
 Tetrahydroxyditolyl, 997.  
 Tetrahydroxytoluene, paranitro-, 970.  
 Tetramethoxyditolyl, 997.  
 Tetramethylaldine, 613.  
 Tetramethylammonium hydroxide, heat of neutralisation of, 811.  
 Tetramethylbenzene, consecutive, synthesis of, 39.  
 Tetramethylbrazilin and its derivatives, 55, 56.  
 Tetramethyldiamidobenzhydrol, derivatives of, 1189.  
 Tetramethyldiamidobenzophenone, action of nitrous acid on, 511.  
 ——— derivatives and reactions of, 1188.  
 ——— nitroso-, salts of, 511.  
 Tetramethyldiamidodinaphthylphenylmethane, 151.  
 Tetramethyldiamidophenylmethane, 130, 146.  
 Tetramethyldiamidodiphenylmethane, nitro-derivatives of, 146.  
 Tetramethyldiamidotriphenylmethane, preparation of, 510.  
 Tetramethyldipicolyl methiodide, 161.  
 Tetramethyldiquinoxaline, 604.  
 Tetramethylene bromide, 950.  
 ——— hexabromo-, 1128.  
 Tetramethylenediamine and putresine, identity of, 33.  
 ——— conversion of pyrroline into, 1208.  
 ——— in cystinuria, 1024.  
 Tetramethylglycoluril, 126.  
 Tetramethylindamine sulphide, 777.  
 ——— thiosulphonate, 777.  
 Tetramethylindole, 1209.  
 Tetramethylmandelic acid, [2 : 3 : 4 : 5], 50.  
 Tetramethylnaphthylpararosaniline, 1190.  
 Tetramethylparaphenylenediaminethiosulphonic acid, 777.

Tetramethylphenylacetic acid, [2:3:4:5], 50.  
 Tetramethylphenylglyoxylic acid, [2:3:4:5], 50.  
 Tetramethylphenylmethyl- $\alpha$ -naphthylamine and its derivatives, 1191.  
 Tetramethylphloroglucinol, bi-secondary, 497.  
 Tetramethylpyrrolypyrroline, 409.  
 Tetramethylpyrrolypyrrolinecarboxylic acid, 408.  
 Tetramethylsuccinic acid, 1145.  
 Tetramethyltriamidobenzophenone, 1189.  
 Tetramethyltriamidotriphenylmethane, derivatives of, 1189.  
 Tetranaphthylamine, thio-, 51.  
 Tetraphenylcrotonolactone, *Proc.*, 137.  
 Tetraphenyldiquinoxaline, 605.  
 Tetraphenylpyrroline, 162.  
 — tetranitro-, 623.  
 Tetraphenylsuccinic acid, 999.  
 Tetraphenylsuccinonitrile, 883.  
 Tetrapyrrolinehydrodium hydrochloride, dichloro-, 352.  
 Tetrathionates, action of alkalis on, 823.  
 Tetrazodiphenyl, 262.  
 Tetrazole series, amidoximes and azoximes of, 977.  
 Tetrene, derivatives of, 249.  
 Tetrethylammonium chloride, magnetic rotatory power of, *TRANS.*, 715.  
 Tetrethylbenzene [1:2:3:4], 41.  
 — symmetrical, and its derivatives, 40.  
 Tetrethylbenzenesulphonic acid, salts of, 40.  
 Tetrethylindamine thiosulphonate, 778.  
 Tetrethylphloroglucinol, 247.  
 Tetrethylphosphonium dibromide, *TRANS.*, 128.  
 — dichloride, *TRANS.*, 130.  
 — heptabromide, *TRANS.*, 131.  
 — salts, *TRANS.*, 135.  
 — action of chlorine and bromine on, *TRANS.*, 126.  
 — sulphate, compounds of, with chlorine and bromine, *TRANS.*, 132, 133.  
 — tetrachloride, *TRANS.*, 130.  
 — tribromide, *TRANS.*, 131.  
 — trichloride, *TRANS.*, 132.  
 Tetrollic acid, reduction of, 878.  
 Tetronal, 1233.  
 Thallin sulphate, influence of, on digestion, 534.  
 Thallium antimonate, 1124.  
 — effect of, on the freezing point of sodium, *TRANS.*, 671.  
 — estimation of, 927.  
 — molecular weight of, *TRANS.*, 531, 533.  
 — vapour-density of, 674.

Thallium volumetric estimation of, 1246.  
 Thermochemistry of acids of the oxalic series and of fumaric and maleic acids, 1097.  
 Thermochemistry of cyano- and nitro-camphors, 1098.  
 — of phenylenediamines, 1099.  
 — of the thionic acids, 667.  
 — principles of, *TRANS.*, 14.  
 Thermoelectric properties of compounds, effect of occluded gases on, 92.  
 Thermometers, mercurial, made of Jena glass, rise in the zero point in, 1041.  
 — of short range, estimation of the value of a degree of, 203.  
 Thialdine, action of orthotolylthiocarbimide and of phenylthiocarbimide on, *TRANS.*, 626, 627.  
 Thiazole, 724.  
 Thiazoles, amido- and their isomerides, 414.  
 — from amidothiazoles, 724.  
 — from thiamides, 723.  
 — reduction of oxythiazoles to, 413.  
 Thiazylaniline, 415.  
 Thioantimonites, free, from Colorado, 218.  
 Thiocarbamides, action of hydroxylamine on, 1165.  
 Thiocarbimides, *TRANS.*, 618.  
 Thiocarbimidoacetic acid, 969.  
 Thiocyanates, spectro-colorimetric estimation of, 1247.  
 Thionaphthols,  $\alpha$ - and  $\beta$ -, and their derivatives, 715.  
 Thionic acids, action of alkalis on, 823.  
 — thermochemistry of, 667.  
 Thionyl thiocyanate, *TRANS.*, 48.  
 Thionylethylphenylhydrazine, 1163.  
 Thionylphenylhydrazine, 1163.  
 Thioparatoluidine, 602.  
 Thiophen and its homologues, effect of, on the colour of the derivatives of benzene and its homologues, 595.  
 — constitution of, 198.  
 — molecular refraction of, 198.  
 — physical properties of, 387.  
 Thiophenuric acid,  $\alpha$ -, 239.  
 Thiophosphoryl fluoride, *TRANS.*, 306.  
 — action of air and of oxygen on, *TRANS.*, 312, 313.  
 — action of alkalis on, *TRANS.*, 318.  
 — action of ammonia on, *TRANS.*, 318.  
 — action of water on, *TRANS.*, 317.  
 — liquefaction of, *TRANS.*, 322.  
 — properties of, *TRANS.*, 311.  
 — spectrum of, *TRANS.*, 322.  
 — vapour-density of, *TRANS.*, 308.  
 Thiophthalide, 140.

- Thiostannic acid, 1053.  
 Thiosuccinic anhydride, 960.  
 Thiosulphates, 942.  
   — action of acids on, 824, 943, 1107.  
   — action of metallic salts on, 1107.  
 Thorium metaphosphate, 757.  
 Thrombosis and blood tablets, 427.  
 Thymol, action of iodine on, in alkaline solutions, 1151.  
   — diiodo- or iodoxyiodo-, 1151.  
   — iodo-, 697.  
   — iodoamido-, 993.  
   — new test for, 657.  
 Thymolparasulphonic acid, orthiodo-, 993.  
 Thymoquinone, iodo-, 1185.  
 Tiglic acid, constitution of, 587.  
   — — dibromide, 587.  
   — — oxidation of 374.  
   — aldehyde, action of sulphurous anhydride on, 487.  
 Tiles, oriental enamel on, 1112.  
 Tin and antimony, separation of, 77.  
   — atomic weight of, 19.  
   — in sugar, 1036.  
   — lowering of the freezing point of, by the addition of other metals, *TRANS.*, 667.  
   — microchemical reactions of, 78.  
   — molecular weight of, *TRANS.*, 531, 533.  
   — oxidation of, 351.  
   — oxide, new, 1051.  
   — precipitated, 107.  
   — salts, action of sodium thiosulphate on, 1109.  
   — volumetric estimation of lead in the presence of, 549.  
 Tin-cadmium alloys, *TRANS.*, 679.  
 Tin-lead alloys, *TRANS.*, 677.  
   — — estimation of lead in, 309.  
   — — sp. gr. and composition of, 1051.  
 Tin-zinc alloys, *TRANS.*, 679.  
 Titanic acid, action of sodium on, 1122.  
   — — hydrochloride, 947.  
   — anhydride, fourth form of, 354.  
   — iron, action of sodium on, 1123.  
   — — action of sulphuric acid on, 947.  
   — — composition of, 948.  
 Titanium, 1122.  
   — compounds, 947.  
   — estimation of, in iron ores, 189.  
   — estimation of, in natural silicates, 443.  
   — ethyl, attempts to prepare, 591.  
   — fluorides, double, 107.  
   — peroxide, 572.  
   — sesquioxide, 1122.  
   — trichloride, reduction of, 1123.  
 Tobacco leaves, slow combustion of, 369.  
   — screenings, analysis of, 543.  
 Tobaccos, Japanese, 69.  
 Tolane dichlorides,  $\alpha$ - and  $\beta$ -, 262.  
 Tolazinedicarboxylic acid, diamido-, 1154.  
 Tolidine, meta-, preparation of, 701.  
 Tolil, para-, 513.  
 Tolilbenzil, ortho- and para-, 147.  
 Tolilbenzoïn, ortho-, 147.  
 Toluene, dispersive power of, 805.  
   — halogen-derivatives of, 985.  
   — — metanitro-, preparation of, 696.  
   — — reduction-products of, 701.  
   — — paranitro-, estimation of, 84.  
   — — pentamido, 390.  
   — — trinitrodiamido, 390.  
   — — trinitrodibromo-, 390.  
 Toluenes, chlorobromo-, 896.  
 Toluic acid,  $\beta$ -amidopara-, 394.  
   — — bromonitro-, 495.  
   — — chloronitro-, 496.  
   — — metamido-, 495.  
   — —  $\alpha$ -nitropara, 395.  
   — —  $\beta$ -nitropara-, 394.  
   — — orthamidometanitropara-, 495.  
   — — orthobromometamidopara-, 495.  
   — — orthobromopara-, 496.  
   — — paradibromopara, 496.  
   — — acids, bromo-, 987.  
   — — chlorobromo-, and chlorobromonitro-, 966.  
   — — chloropara-, 988.  
   — — thermochemistry of, 1096.  
   — nitrile, ortho-, heats of combustion and formation of, 812.  
 Toluidine, action of sulphur on, 602.  
   — diazotised para-, action of, on methylparabromaniline, *TRANS.*, 433.  
   — — action of, on methylparachloraniline, *TRANS.*, 436.  
   — last runnings obtained in the purification of, 600.  
   — nitrometa-, 495.  
   — para-, action of sulphur on, *TRANS.*, 228.  
 Tolunitranilic acid, 969.  
 Toluoin, para-, 513.  
 Toluylorthobenzoic acid, para-, 242.  
 Toluquinol diamido-, 970.  
   — nitramido-, 970.  
   — nitro-derivatives of, 969.  
 Toluquinoline, parabromortho-, and its derivatives, 1214.  
 Toluquinone, metabromo-, 128.  
 Toluquinoxaline, meta-, derivatives of, 1065.  
 Toloric acids, ortho-, para-, and meta-, 708.  
 Toluylaldehydephenylhydrazone, meta-, 251.

- Toluylycyanamide, ortho-, 1165.  
 Toluylene diazosulphide, 772.  
 Toluylyhydroxythiocarbamide, ortho-  
 1165.  
 Tolyl benzyl ketone, para-, 883.  
 Tolyacetic acid, para-, 883.  
 Tolybenzoylthiocarbamide, ortho-  
 TRANS., 622.  
 Tolycumenylcarbamide, 774.  
 Tolyhydrazine, meta-, 702.  
 — para-, action of chloroform and  
 alcoholic potash on, TRANS., 247.  
 Toly- $\beta$ -imidobutyric acid, ortho-, 1171.  
 Tolylosazoneglyoxalcarboxylic acid,  
 para-, 238.  
 Tolyphenylacetoneitrile, para-, 597.  
 Tolyphenylketoxime and its intramole-  
 cular change, 1067.  
 Tolypyrazole, ortho-, 1217.  
 — para-, 1216.  
 Tolypyrazoline, 1216.  
 — para-, 1217.  
 Tolythiocarbimide, ortho-, action of,  
 on thialdine, TRANS., 626.  
 Tourmaline, composition of, 472.  
 — formula of, 765.  
 — from Schuttenhofen, constitution  
 and colour of, 764.  
 Tourmalinic-pegmatite from Ričan, 357.  
 Toxicological investigations, destruction  
 of organic matter in, 653.  
 Trees, forest, absence of nitrates in, 541.  
 — reserve materials of, 740.  
 Trehalose from fungi, 740.  
 Triacetyldiamidohydroxynaphthyl-  
 phenyl, TRANS., 124.  
 Triacetylquinide, 991.  
 Triammonium fluoroxymolybdate, 106.  
 Triazimidoacetamide, 370.  
 Triazoacetamide, 370.  
 Triazoacetic acid, 369.  
 — — constitution of, 587.  
 Triazobenzenedisulphonic acid, 399.  
 Triazobenzenesulphonic acid, meta-  
 397.  
 Triazo-derivatives, 369.  
 Triazodibromobenzenesulphonic acid,  
 399.  
 Triazole-series, amidoximes and azoximes  
 of, 977.  
 Triazorthotoluenesulphonic acid, para-  
 and ortho-, 398.  
 Tribenzamidophloroglucinol, synthesis  
 of, 249.  
 Tribenzoylglycerol, 1152.  
 Tribenzoylpyrogallol, 1152.  
 Tribenzylenebenzene, ortho-, 1172.  
 Tribenzylhydroxylamine, 703.  
 Tribenzylphosphine oxide, action of  
 chlorine on, TRANS., 227.  
 — — action of nitric acid on,  
 TRANS., 225.  
 Tribenzylphosphine oxide, action of sul-  
 phuric acid on, TRANS., 226.  
 — — some compounds of, TRANS.,  
 223.  
 — — trinitro-, TRANS., 225.  
 Tributylene dichloride, dichloro-, 843.  
 Tricarballylamide, 239.  
 Tricarballylamidimide, 239.  
 Tricarballylanilic acid, 238.  
 Tricarballylic acid, 238.  
 — — heat of combustion of, 668.  
 Tricarballylparaditoluidic acid, 238.  
 Tricarballylparaditolyl, 238.  
 Tricarballylparatoluidic acid, 238.  
 Tricarballylparatoluidide, 238.  
 Tricyanides, 696.  
 — normal, the discovery of, 951.  
 Tridecylutidine, 1017.  
 Tridecylutidinedicarboxylic acid hydro-  
 chloride, 1017.  
 Triethylamine arsenious bromide, 211.  
 — hydrochloride, magnetic rotatory  
 power of, TRANS., 715.  
 — magnetic rotatory power of,  
 TRANS., 692, 729.  
 — properties of, 688.  
 Triethylhexadecylammonium iodide,  
 689.  
 Triethylhydroxylamine, 112.  
 Triethylmetadiazine, amido-, 684.  
 Triethylphosphine, arsenious bromide,  
 211.  
 Triethylsulphine iodide, conversion of,  
 into trimethylsulphine iodide, 1135.  
 — — salts, preparation of, TRANS., 135.  
 Trihydromethylenefurfuran, 845.  
 Trihydroxyglutaric acid, 33.  
 Trihydroxyisobutyric acid, 478.  
 Trihydroxy- $\beta$ -naphthylamine, 1197.  
 Trihydroxystearic acids, 1147.  
 Triketohexylene, hexachloro-, 967.  
 Trimesic acid, thermochemistry of, 1096.  
 Trimethintriiazimide, 370.  
 Trimethoxybenzene, and its trinitro-  
 derivatives, 390.  
 Trimethoxyphenylpropionic acid, 256.  
 Trimethyl carbinol, bromo-, 951.  
 Trimethylamine arsenious bromide,  
 211.  
 — — heat of neutralisation of, 811.  
 — — properties of, 688.  
 Trimethylbrazilin, 56.  
 Trimethylecolchicine acid, 283.  
 Trimethylecolchidimethinic acid, 283.  
 Trimethylene cyanide, boiling points of,  
 690.  
 — — magnetic rotatory power of,  
 TRANS., 702.  
 — — liquefaction of, 1126.  
 Trimethylenediamine, derivatives of,  
 486.  
 Trimethylenedinitramine, 492.



Trimethyleneorthotolyldiamine, 1217.  
 Trimethyleneparatolyldiamine, 1216.  
 Trimethylenephenyldiamine, 1215.  
 Trimethylenetrinitrosamine, 33.  
 Trimethylethyleneglycol from methyl isopropenyl carbinol, 115.  
 Trimethylhexadecylbenzene, 130.  
 Trimethylhydrastylammonium iodide, 1221.  
 Trimethylhydroxypyrimidine, 1006.  
 Trimethylindoles,  $[3 : 2' : 3']$  and  $[1 : 2' : 3']$ , 259.  
 Trimethylphenylmethane, 127.  
 — bromination of, 240.  
 Trimethylphloroglucinol, 497.  
 Trimethylpyrroline, 728.  
 Trimethylsulphine iodide, 1135.  
 Triolein, distillation of, under pressure, 586.  
 Trional, 1233.  
 Triphenylbismuthine, 1061.  
 — dibromide and dichloride, 1061.  
 Triphenylbutyrolactone, *Proc.*, 138.  
 Triphenylcrotonolactone, *Proc.*, 137.  
 Triphenyl- $\gamma$ -hydroxybutyric acid, *Proc.*, 138.  
 Triphenylmetadiazine, amido-, 684.  
 Triphenylmethane, action of potassium on, 882.  
 Triphenylosotriazone, 51.  
 Triphenylpyrazole, *Proc.*, 141.  
 Triphenylpyrroline, 149.  
 Tripropylamine, magnetic rotatory power of, *Trans.*, 694, 730.  
 Triquinaldyl carbinol, 504.  
 Trithionates, action of alkalis on, 823.  
 Tritolylbismuthine, para-, and its derivatives, 1061.  
 Trixylylbismuthine and its derivatives, 1062.  
 Truxene, 699.  
 Truxenequinone, 699.  
 Truxillic acid,  $\delta$ -, 1195.  
 — acids, constitutions of, 1196.  
 — isomeric, 1194.  
 — salts and derivatives of, 1196.  
 — anhydrides, intramolecular changes in, 1195.  
 Truxillopiperidic acids, 1213.  
 Truxillopiperidides, 1213.  
 Truxone, 699.  
 Tubes, graduation of, for gasometric purposes, 301.  
 Tungsten, estimation of, in its alloys, 798.  
 — hexachloride, action of ammonia on, *Trans.*, 44.  
 — oxychlorides, action of ammonia on, *Trans.*, 43.  
 Tungstic anhydride, action of ammonia on, *Trans.*, 42.

Tungstic anhydride, action of ammonium chloride on, *Trans.*, 42.  
 Turpentine, oil of, spontaneous oxidation of, 615.  
 — Russian, specific rotatory and refractive powers of, 453.  
 Tyrosine in dahlia bulbs, 433.

## U.

Ultramarine, green, 758.  
 Umbers, 678.  
 Undecylenic acid, oxidation of, 375.  
 Unsaturated compounds, oxidation of, 231.  
 — the part played by water in the oxidation of, 232.  
 Uramidobenzoyl, 609.  
 Uranite from Madagascar, 22.  
 Uranium phosphate, 757.  
 — salts, physiological action of, 537.  
 Urea, amount of, in blood and muscle, 914.  
 — the Knop-Hüfner method of estimating, 1039.  
 — See also carbamide.  
 Ureides and their nitro-derivatives, 125.  
 Ureines, 125.  
 Uribilinuria, 637.  
 Uric acid, estimation of, in human urine, 1040.  
 — estimation of, in urine, 1250.  
 — volumetric estimation of, 449.  
 Urine, biliary acids in, during jaundice, 637.  
 — detection of sugar in, 85, 552.  
 — detection of urobilin in, 324.  
 — diabetic, glycogen in, 65, 293.  
 — estimation of albumin in, 88, 452.  
 — estimation of the total nitrogen in, 649.  
 — estimation of uric acid in, 1250.  
 — evolution of hydrogen sulphide in the, 432.  
 — febrile, aromatic substances in, 65.  
 — formation of volatile fatty acids in the ammoniacal fermentation of, 431.  
 — human, estimation of uric acid in, 1040.  
 — rennet in, 535.  
 — in melanuria, 637.  
 — nitrogenous constituents of, 535.  
 — normal and pathological, pepsin in, 430.  
 — presence of carbohydrates [dextrose and animal gum] in, 293.  
 — pigments of, 531.  
 — reducing substances in, 535.  
 — relation between the total sulphuric acid of the, and that as ethereal sulphates in rest and work, 430.

Urobilin, detection of, in urine, 324.  
Uvic acid, thermochemistry of, 1096.

V.

Valeric acid,  $\gamma$ -amido-, 961.  
— anhydride,  $\gamma$ -amido-, 961.  
Valeroximidolactone,  $\gamma$ -, 1061.  
Vanadates, 351.  
Vanadinite from Leadhills, TRANS., 94.  
Vanadium, fluorine-compounds of, 107, 1123.  
— oxyfluorides, compounds of, with metallic fluorides, 108.  
— new fluorine compounds of, 214.  
Vanadotungstic acid, 762.  
Vanadyl difluoride, 1123.  
Vapour-densities of elements and compounds at a white heat, 673.  
Vapour-density determinations, 460.  
— estimation of, underdiminished pressure, 331.  
— method of determining, applicable at all temperatures and pressures, PROC., 1888, 110.  
— of aluminium methide, 695.  
— of ethyl isocyanurate at different temperatures, 1128.  
— of hydrogen fluoride, TRANS., 163.  
Vapour-pressures of a mixture of propyl alcohol and water, PROC., 1888, 101.  
— of aqueous solutions, 668.  
— of chemically combined and adsorbed water, statical and dynamical methods of measuring, 1045.  
— of quinoline, TRANS., 483.  
— of similar compounds of elements, TRANS., 486.  
Vapours, determination of the vapour-density by means of the velocity of sound in, 460.  
Vapour-tensions, method of determining, at low temperatures, 6.  
— of alcoholic solutions, 7.  
— of methyl alcohol, 579.  
— of solutions of potassium hydroxide, 205.  
Vetches, fat from, 295.  
*Vicia sativa*, presence of betaine and choline in the seeds of, 1029.  
Victoria-blue, 1190.  
Vine, occurrence of boric acid in, 295.  
Vinylbenzylcarboxylic acid, orthodichloro-, 270.  
Vinylchlorobenzylcarboxylic acid, orthodichloro- and trichloro-, 270.  
Voltaic balance, detection of the combining proportions of compounds by the, 665.  
— cells, two fluid, 89.

Voltaic couple, change of potential in, 200.  
— effect of chlorine on the E.M.F. of, 90.  
— electricity, development of, by atmospheric oxidation, 90.  
— energy of electrolytes, 665.  
Volume, molecular, and refraction, new theory of, 326.  
Volumes, molecular, new formula for calculating the, at the boiling point, 100.  
— of aromatic compounds, 1047.  
— of benzene, naphthalene, anthracene, &c., 336.  
— of liquids, 566.  
— specific, of benzene and its halogen-derivatives, TRANS., 488.  
— of borneol and camphor, 785.  
— of similar compounds of elements, TRANS., 486.  
Volumetric apparatus, 1086.

W.

Watches, non-magnetisable alloys of palladium for, 573.  
Water, absorptive power of, for atmospheric gases, 935.  
— alleged formation of nitric and nitrous acid in the evaporation of, 183.  
— analysis, loss on ignition in, 551.  
— black, of some equatorial rivers, 226.  
— chemically combined and adsorbed, statical and dynamical methods of measuring the vapour-pressures of, 1045.  
— composing the Clyde sea area, chemical composition of, 359.  
— distilled, electrolysis of, 1094.  
— estimation of dissolved oxygen in, 79, TRANS., 552.  
— estimation of, in silicates, 546.  
— estimation of the total organic nitrogen in, by the Kjeldahl process, 796, 1035.  
— expansion of, PROC., 89.  
— from Roncegno, 28.  
— influence of the consumption of, on the alimentation of animals, 287.  
— mineral, of the Admirals-gartenbad, Berlin, 27.  
— of the Ottili spring, Suhl, Thuringia, 1054.  
— of the Nile, fertilising properties of, 646.  
— potable, presence of ammonia and nitrous acid in, 1234.  
— rain-, analysis of, TRANS., 543.

- Water, rain-, at Rothamsted, amount of nitric acid in, *TRANS.*, 537.  
 ——— composition of, 299.  
 ——— of tropical districts, nitrates in the, 923.  
 ——— salt in, 299.  
 ——— rapid method of analysing, prior to its softening for technical purposes, 1035.  
 ——— sea, estimation of bromine in, 74.  
 ——— solubility of minerals in, 682.  
 ——— solubility of various forms of calcium carbonate in, 344.  
 ——— specific heat of, of different densities, 666.  
 ——— solubility of oxygen in, 936.  
 ——— volumetric estimation of gases dissolved in, 1034.  
 Water-baths, draught arrangement for, 437.  
 Waters, natural, direct estimation of oxygen and nitrogen in, 551.  
 ——— estimation of nitrates in, 312, 438.  
 ——— estimation of organic nitrogen in, by the Kjeldahl method, 796, 1035.  
 ——— of some American alkali lakes, 29.  
 ——— of the Yellowstone National Park, 682.  
 Wax, analysis of, 322.  
 Wheat, East Indian, composition of, 184.  
 ——— experiments on, at Grignon in 1888, 541.  
 ——— gluten in, 296, 740, 919.  
 ——— manuring of, with phosphates, 1242.  
 Wheat-grain, presence of gluten in, 296.  
 Wheats, spring, grown in 1887, composition of, 183.  
 White lead, composition of, 21.  
 White precipitate, 347.  
 ——— solubility of, in solution of ammonia containing ammonium carbonate, 755.  
 Wine analyses, mode of stating the results of, 799.  
 ——— detection of foreign colouring matter in, 1091.  
 ——— estimation of glycerol in, 446.  
 ——— indirect estimation of the extractive matters of, 1091.  
 ——— occurrence of boric acid in, 295.  
 ——— tests for archil, cochineal, and magenta in, 655.  
 ——— testing the colouring matter of, 655.  
 Wine-must, absence of nitric acid in, 541.  
 Wines, influence exerted by salicylic acid on the proportions of glycerol and alcohol formed in, 433.  
 ——— sweet, estimation of phosphoric acid in, 547.  
 Wood of the beech, 1084.  
 Wood-fescue, analyses of, 1078—1082.  
 Wood-gum, 847.  
 Wood-spirit, estimation of methyl alcohol in, 84.  
 Work, change of substance in the horse during, 911.  
 ——— muscular, effect of, on the glycogen of the muscles, 428.

## X.

- Xanthine, amount of, in various organs and in yeast, 791.  
 ——— formation of in yeast, 1028.  
 Xanthophyllidrin, 900.  
 Xenotime, 355.  
 ——— analyses of, 217.  
 Xenylene-pyrazine, *TRANS.*, 98.  
 Xylene, behaviour of, in the animal system, 708.  
 ——— dibromometa-, and its derivatives, 39.  
 ——— nitro-, oxidation of, 394.  
 ——— orthodiamidometa-, 39.  
 ——— paramido-, thio-base from, 603.  
 Xylenes, chlorobromopara-, and their derivatives, 965.  
 Xylenesulphonic acid, bromo-, 611.  
 Xylenol, consecutive meta-, 41.  
 Xylenols, dinitroortho-, 129.  
 Xylidine carbamate, 241.  
 ——— cyanate, 241.  
 ——— cyanurate, 241.  
 ——— diamido-, 604.  
 ——— 1 : 2 : 3 : meta-, and its identity with Wroblewski's ortho-xylidine, 131.  
 ——— nitro-, 604.  
 ——— nitroacetylpara-, 604.  
 ——— para-, preparation and properties of, 603.  
 Xylidines, para- and meta-, the sulphonic acids of, 611.  
 Xylidinesulphonic acid, para-, 611.  
 Xylobenzaldehyde, meta-, 131.  
 Xylobenzyl alcohol, meta-, 131.  
 Xylobenzylamine, meta-, 131.  
 Xyloquinolinesulphonic acids, para-, 164.  
 Xylose, 847.  
 ——— formation of, from malt residues, 480.  
 ——— molecular weight of, 367.  
 Xylol carbinol, meta-, 131.  
 ——— phenyl ketone, para-, 883.  
 Xylamidomethane, meta-, 131, 391.  
 Xylbenzamidomethane, meta-, 391.  
 Xylcarbamide, 241.  
 Xylene diazosulphide, 772.

**Y.**

- Yeast, anærobic, disengagement of carbonic anhydride by, 539.
- beer-, 181.
- formation of sugar and other substances in, 1027.
- Yeast-poisons, 181.
- Yttria, spectra of, 456.
- Yttrium group, spectra of, TRANS., 269.
- potassium phosphates, 18.
- pyrophosphate, 757.
- sodium phosphates, 18.

**Z.**

- Zinc ammonium carbonate, basic, 1049.
- atomic weight of, TRANS., 443.
- blende, modifications of, 836.
- chromite, 1111.
- effect of, on the freezing point of sodium, TRANS., 674.
- electrolytic separation of cadmium from, 1033.

- Zinc, estimation of, in presence of manganese, 549.
- mineral from a blast furnace, PROC., 67.
- molecular weight of, TRANS., 531, 533.
- molybdate, 760.
- oxide, dissociation of, in the vapour of zinc, 755.
- — volumetric estimation of, 309.
- separation of, from cobalt, 653.
- separation of, from nickel, 652.
- sodium oxides, 674.
- sulphate, action of hydrogen sulphide on, 346.
- sulphide, dissociation of, by means of metallic zinc, 946.
- — hexagonal, 20.
- Zinc-lead alloys, TRANS., 678.
- Zinc-tin alloys, TRANS., 679.
- Zircon, artificial production of, 355.
- in a rock from Colorado, 1054.
- Zirconium and aluminium, separation of, 550.